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BY F. D. AND A. J. HERBERTSON

AFRICA

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RIVER ZAMBEZI TWO MILES BELOW FALLS

Descriptive Geographies from Original Sources

A F R I C A

SELECTED BY

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“It is to me a standing marvel how scholars can endure, for all these centuries, to have only the name of . . . hills and rivers on their lips, . . . and never one line of conception of them in their mind’s sight.”

JOHN RUSKIN.

NOTE TO FOURTH EDITION.

Some of the changes have involved alterations in names. In Africa, Cape Colony and Orange River Colony became the Provinces of the Cape of Good Hope and Orange Free State when the Union of South Africa was formed in 1910. Since 1907 British Central Africa has been called the Nyasaland Protectorate, and in 1920 the Protectorate of East Africa was annexed to the Crown and entitled the Colony of Kenya. Though the old names occur in some of the extracts given in this book about these countries the descriptions have been retained as they are still good in other respects.

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PREFACE

THE modern teaching of geography, like that of history, lays increasing stress on the value of original authorities. One of the first steps in this direction was the bibliography appended to Sir Archibald Geikie's *Teaching of Geography*, followed in 1897 by Dr. H. R. Mill's *Hints to Teachers and Students on the Choice of Geographical Books*, compiled at the request of the Geographical Association. The present series goes a step further, and attempts to depict the world in the language of men who have seen it. The difficulties of the task of selection, and of avoiding either deficiency or redundancy, have been exceedingly great. The inexorable law of copyright has in many cases largely restricted the area of choice. Many excellent extracts have had to be rejected on account of their length, or because they dealt with matters of secondary importance, or, still more often, because an individual author was already too fully represented. In several cases a certain amount of condensation has been necessary. This has been effected by omission where necessary.

It is hardly necessary to say that the series is intended as a stimulus to, and not as a substitute for, individual reading, and to this end a number of additional references are given without quotation, and a somewhat full bibliography is appended. From almost every book and paper included, a large number of excellent supplementary passages could be made. With regard to the best method of using the series, the editors do not presume to dictate to teachers, but for those who may wish to use it as a class-book an introduction is prefixed, summarising the

geography of each continent and referring for fuller details to the illustrative passage.

In the previous volumes of the series the editors have gratefully acknowledged their thanks to the Royal Geographical Society, the Royal Scottish Geographical Society, and the Manchester Geographical Society for permission to make use of their journals. In the case of Africa these obligations are necessarily much greater. Much of the exploration of that continent has been carried out at the inspiration and under the auspices of these Societies, more especially the two former. Their official journals, more especially those of the Royal societies, are our principal sources of information for nearly every part of Africa, and no teacher who desires to keep abreast of the rapid progress of discovery and economic development in that continent can afford to dispense with them. The numerous extracts included, and the supplementary references, though considerable in themselves, give no adequate idea of the material available from these sources. The editors beg to express their sincere thanks to the societies mentioned for the facilities so generously afforded to them.

In addition the editors desire to thank the Agent-General for Natal, Sir H. M. Stanley, Sir H. H. Johnston, Canon C. H. Robinson, Mrs. Lionel Phillips, Dr. R. W. Felkin, G. Lacy, Esq., J. E. S. Moore, Esq., A. Silva White, Esq., W. H. Wilkins, Esq., Messrs. George Allen, Edward Arnold, A. & C. Black, Blackwood, Chapman and Hall, Chatto and Windus, Donald Currie, W. Heinemann, Hodder and Stoughton, Hurst and Blackett, Longmans, Sampson Low, Macmillan, Methuen, Murray, Kegan Paul, C. Arthur Pearson, G. Philip and Son, Sonnenschein, E. Stanford, and Ward and Lock, the Editor of the *Manchester Guardian*, for permission to quote from copyright works, as well as the numerous authors of scientific papers who have kindly permitted extracts to be made from them. These obligations are acknowledged in detail at the end of each extract.

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INTRODUCTION

AFRICA

AFRICA is the south-western part of the Old World (see p. 1). It is attached to Eurasia by the Isthmus of Suez (72 miles), and separated from it by the Mediterranean (Strait of Sicily, 95 miles, Strait of Gibraltar, 9 miles, both about 1000 feet deep) and by the Red Sea (Strait of Bab-el Mandeb, or Gate of Tears, 14 miles wide). The Atlantic divides it from South America in the west (1750 miles from Sierra Leone to Cape San Roque), and the Indian Ocean from Eastern Asia and Australia. Madagascar to West Australia, 4160 miles; Durban to Perth, about 5000 miles.

The extreme points are, Cape Blanco, $37^{\circ} 20' N.$, Cape Agulhas, $34^{\circ} 51' S.$ —distance 5000 miles; Cape Verde, $14^{\circ} 35' W.$, and Ras Hafun, south of Cape Guardafui, $51^{\circ} 28' E.$ —distance about 4500 miles.

The area is 11,500,000 square miles, nearly 3 times Europe, 230 times England. The coast-line is variously estimated; neglecting small bays it is about 20,000 miles.

The great gulfs are the Gulf of Guinea in the west coast, the Gulf of Aden between the Horn of Africa and Arabia, the Gulfs of Sidra and Gabes in the Mediterranean.

The western islands are mainly volcanic—the Azores, Madeira, the Canaries, Cape Verde, Fernando Po, and others in the Gulf of Guinea. So are Réunion, Mauritius, the Admiralty and Seychelles Islands in the east. Sokotra is an outlier of the Horn of Africa, and Madagascar, the largest island, is separated from the mainland by the Mozambique Channel (250 miles).

Configuration.—Africa is a plateau, with an average elevation of 2150 feet. It is lower in the north, from 1000 to 2000 feet, and higher in the south, 3000 to 5000 feet.

The coastal plain, under 600 feet, is broadest in the north and west of the Sahara, where much of it is covered with sand-dunes. In most other regions it is very narrow, but widens round the Guinea coast and near the mouth of the Zambezi, where it is fringed by a warm, moist, dark mangrove swamp (see pp. 67, 83, 165).

Beyond the coastal plain the land rises steeply to the plateau, from which the rivers descend by a series of rapids, *e.g.* the cataracts of the Nile (see p. 47), the Busa and other rapids of the Niger, the Yellala and other falls of the Congo (see p. 137), the Kebrabasa falls of the Zambezi (see p. 168).

In the extreme north-west is: (1) the folded mountain range of the Atlas. The table-lands, which form the bulk of Africa, may be divided into, (2) the Northern plateau of the Sahara and Upper Guinea, (3) the Congo basin, (4) the Abyssinian and East African plateaus east of the Nile, Lakes Tanganyika and Nyasa, and (5) the plateau of South Africa.

(1) The *Atlas* in the west consists of the Great Atlas of Morocco (see pp. 13, 14), which run north-eastward from Cape Gir, and rise to over 14,000 feet in Ayashin. Many streams run north-westwards from them to the Atlantic, on which the towns and villages of Morocco are built. South of the Great Atlas is a plateau land which ends in the Little or Anti Atlas, south of which is the Wadi Draa.

From the Strait of Gibraltar, a range called Er Rif runs eastwards parallel to the coast of Algeria, as the North Algerian or Tell Atlas, which disappear under the Sicilian Strait at Cape Blanc or Blanco.

To the south is the Algerian plateau, drained in the east by the Majerda, and bordered on the south by the Saharan Atlas. Both on the plateau, and in a depression south of the Saharan Atlas are a number of salt lakes or shotts (see p. 21).

(2) The *Northern Plateau* consists of the Sahara desert, which is bordered on the south by the Upper Guinea plateau.

The *Sahara* ($3\frac{1}{2}$ millions square miles in area, *i.e.* almost as large as Europe and 70 times as large as England) is the largest desert in the world. It is crossed from north-west to south-east by the flat-topped, steep-sided table mountains of Tazili

and Tibesti—the Tarso Mountains—which rise to 8000 feet, and separate the western from the eastern Sahara. The latter includes the Libyan and Nubian deserts, and the plateau east of the Nile. The average height of the Sahara is 600 to 1000 feet in the west, 2000 to 2800 feet in the centre, 750 to 1500 in Lybia and Nubia, and 1500 to 3000 feet east of the Nile. Other stony plateaus rise above the general level in Ahaggar and Aïr, while depressions exist south of the Atlas, where large salt lakes or shotts are found (see p. 21), and round the oases of Siwa and the Fayûm.

The surface consists of sand-dunes and great stony wastes, the latter predominating in the centre and other higher regions. Here and there a low scrub is found. Several wadis cross it, the Igharghar running north, and the Tafasasset south from the Ahaggar plateau.

The Niger forms an elbow in the desert in the south, and the Nile crosses the Sahara from south to north in the east.

The *Upper Guinea Plateau* is the higher ground which separates the Niger basin from the basins of the Volta and the smaller rivers, which flow due south to the Gulf of Guinea. The western part, the Futa Jallon plateau, the source of the Senegal, Gambia, and Niger, rises to nearly 5000 feet. The central part formerly known as the mountains of Kong may be called the Kong plateau.

A line of volcanic peaks runs south-westward from the north-east corner of the Gulf of Guinea. The highest is the peak of the Cameroons (13,370 feet), (see p. 99), succeeded by those forming the Islands of Fernando Po, Principe, St. Thomas, Anno Bom.

The *Lake Chad* depression of the northern plateau is analogous to the Congo basin in the southern one, from which it is separated by a low divide, on the northern slopes of which is the Shari (see p. 98).

(3) The *Congo Basin* is nearly $1\frac{1}{2}$ million square miles in area. It is almost a circular plain from 1000 to 1500 feet above the sea, rising to between 3000 to 5000 feet on all sides except the north, where the Congo-Shari divide is probably under 1500 feet, and in the west where the river breaks through the narrow western plateau of Lower Guinea to the Atlantic (see pp. 134-149.)

(4) The *Abyssinian Plateau* is a mass of volcanic rock capping

sedimentary strata. It is 90,000 square miles in area (cf. Great Britain), and rises to over 15,000 feet in Ras Dashan. It is highest in the east, and the rivers flow westwards, in gorges from 1000 to 2000 feet deep (see p. 40).

The *Eastern Rift Valley* runs at the foot of the eastern and south-eastern escarpments of Abyssinia, and can be traced on the map by a line of lakes (Rudolf, Baringo, Naivasha, to Nyasa) (see p. 111). The western boundary of the Eastern plateau is the *Western Rift Valley*, in which are Lakes Albert, Albert Edward, Kivu, and Tanganyika.

The *Eastern Plateau* averages from 3000 to 5000 feet high, and descends by a series of terraces to the north-west and east. Over the former the Nile falls (Murchison and Lado Falls). The highest lands are of crystalline rock origin, like the mass of Ruwenzori (over 16,600 feet), or recent volcanic peaks, Elgon (14,150), Kenya (17,000) (see p. 120), and Kilimanjaro (19,300) (see p. 118), near the Eastern Rift valley, and the active volcano of Kirunga near Lake Kivu, on the Western Rift valley.

In the north-east the plateau forms the Somali Peninsula, or the Horn of Africa (see p. 104), beyond which lies the Island of Sokotra.

(5) The *South African Plateau* extends south of the Congo basin, with an average elevation rarely much below 3000 feet or much above 5000 feet. The western part of the Congo-Zambezi plateau, its northern margin, widens out into that of Angola, which forms the western boundary of the Congo basin, and is drained by the Kwanza and Kunene to the Atlantic (see p. 160). The eastern part forms Nyasaland (see pp. 175-185). South of this is the Zambezi valley, between which and the Orange River stretches a band below 3000 feet in the centre of the land, which we may call the Bechuana depression. The northern part (see p. 195) is a region of inland drainage and wadis, where water flows only after the rains, and evaporates in Lake Ngami or in the Makarikari Salt Marshes. The higher land to the west of this depression forms the Dama-Nama plateau (see p. 193), and gradually rises towards the west, where the highest land is not very far from the Atlantic coast. The loftiest mass is that of Omatako, 8500 feet. This region is also intersected by wadis, as the climate is almost as dry as in the Bechuana depression. To the east of this depression,

the Matabili (Rhodesian) plateau and that of the High Veld rise gradually separated by the Limpopo valley, and also have their highest land near the ocean. The Matabili plateau (see p. 201) has an undulating surface, and is traversed by a strip of higher land known as the Inyanga plateau (7000 feet) in the north-east, and the Matoppo hills in the south-west, which forms the divide between the Zambezi and Limpopo basins. The Shangani and Hanyani, tributaries of the Zambezi, and the Pungwe and Sabi, flowing to the Indian Ocean, are the chief rivers.

The High Veld lies between 4000 and 5000 feet. It slopes gradually upwards from west to east, where it ends abruptly in a steep escarpment. A belt of higher ground, the Witwatersrand (see p. 205), strikes west-east and divides the Northern High Veld, drained to the Limpopo, from the Southern High Veld drained to the Orange. The eastern escarpments of the Northern High Veld or Transvaal is the Drakensbergen (see p. 211), 7000 feet, sinking to the lowlands of Swaziland, which are separated from the coastal plain by the Lebombo escarpment. The eastern heights of the Southern High Veld are the much more complex and higher, Basuto highlands (see p. 210). Their outer and higher tabular ridges are called the Kwathlamba mountains and sometimes the Drakensbergen. Mont aux Sources, where the Orange, the Caledon, the Wilge, a tributary of the Vaal, and the Tugela rise, is 11,000 feet, and Kathkin or Champagne Castle is estimated to be 12,000 feet. Numerous passes cross the Drakensberg escarpments to the north at heights from 5000 to 6000 feet, of which Van Reenen's and Laing's Nek are used for railways. The hilly land of Natal (see pp. 210-212) forms the eastern foreland of this region.

The southern escarpments form the Stormbergen in the east and pass by Compassberg (nearly 9000 feet), the Winterberg, and Nieuwveld to the Roggeveld (5000 to 6000 feet). At their feet is the terrace of the Great Karroo, sloping from 4000 feet in the west to under 3000 feet in the east (see pp. 220-223). It is traversed by wadis, which break in transverse gorges through a line of folded mountains, the Zwartebergen (4000 to 5000 feet), at whose base is the narrower and shorter Little Karroo. Another folded chain, the Langebergen, rising to 5000 feet, forms the southern parapet between it and the sea. Between the eastern ends of these folded ranges are Algoa and St Francis Bays.

Low plains form the south-west of the continent between St. Helena and False Bays, and between the Drakenstein Mountains and the flat-topped Table Mountain, with horizontal strata, continued through the Cape peninsula south of Table Bay, which ends in the famous Cape of Good Hope.

The *West African Islands*.—The Azores, Madeira (see p. 233), the Canaries (see p. 234), Cape Verde Islands (see p. 236), and Fernando Po, and other small islands in the Gulf of Guinea, as well as the mid-Atlantic isles of Ascension (see p. 238) and St. Helena (see p. 240), are volcanic.

The *East African Islands* nearest the coast are of similar structure to the adjacent continent (Sokotra and Madagascar (see pp. 241-245)). Those farther off in the Indian Ocean are volcanic, the chief being Réunion, Mauritius (see p. 245), and the Seychelles.

Rivers and Lakes.—36 per cent of Africa is drained to the Atlantic, 15 per cent to the Mediterranean, 18 per cent to the Indian Ocean, 31 per cent has no outlet to the sea. The divide between the Atlantic and Indian drainage areas lies on the eastern side of the Eastern plateau, and is rarely more than 500 miles from the east coast, except in the Zambezi basin, the only considerable one drained to the east. The Webi, Juba, Tana, Rovuma, and Limpopo are the other rivers flowing eastward. The Nile is the only important river flowing northwards. The Niger and Congo curve in semicircles across great basins to the Gulf of Guinea. The Senegal, Gambia, Volta, Ogowe, Kwanza, Kunene, and Orange are the smaller streams flowing to the Atlantic.

The lakes of Africa are of two distinct types. The Victoria Nyanza, Lakes Tana, Bangweolo, Leopold II., Ngami, Chad, and the Shotts, are simply land hollows filled with water, and are almost as broad as long, with indefinite shores, which vary with the water supply. Lakes Nyasa, Tanganyika, Albert Edward, Albert, Rudolph, and others already mentioned, occur in the West and East Rift valleys, and are narrow, long, deep lakes with well-defined margins.

Inland Drainage.—In the Sahara there are no permanent streams, except the Nile. In the south the Shari comes from the wetter regions, but does not flow beyond Lake Chad, except in very wet seasons, when a stream known as the Bahr el-Ghazal may flow from it to the north-east. Lake Chad varies in

area with the season, growing as large as the six northern English counties (over 12,000 square miles) after the summer rains, shrinking to twice the size of Northumberland before they begin again (to 4000 square miles).

Most of the lakes in the Eastern rift have no outlet. The river Webi in Somaliland is very remarkable, for when it nears the coast it suddenly turns parallel to it and flows for nearly 200 miles, and disappears in a swamp without any visible outlet to the sea. A small part of Gazaland is also unconnected with the sea, but the largest inland drainage system of South Africa is that of the Makarikari salt pan, towards which the Kubango flows through many marshes and the variable Lake Ngami.

Climatic and Vegetation Regions.—The Equator cuts Africa almost half-way between its northern and southern extremities, and in consequence the climatic and vegetation regions are symmetrically arranged on both sides of it.

The equatorial regions are hot and moist. Rain falls at all seasons, and is especially heavy when the Sun is overhead at noon, so that two very rainy seasons are separated by two less rainy ones. The lower lands are covered with dense, wet jungles, which are almost impenetrable (see pp. 64, 84-85, 152-155). These extend over the coastal plain of the Gulf of Guinea, the lower parts of the Congo basin, and the eastern coastal plain. The banana (see p. 78) and oil palm (see p. 79) are the chief economic plants.

To north and south of this region, and also in the higher eastern plateau, the temperature is still high, but not so uniform, becoming cooler during the nights and in winter. The rainfall is also lower and occurs during and immediately after the season when the sun is in the zenith at noon. The vegetation is less dense. The woods become glades and form shady groves along the water-courses (see pp. 123-124). These savana lands of Africa are continuous through the Sudan, the East African plateau, and the Congo-Zambezi plateau. Owing to the rains brought by the south-east trade winds of summer to the south-east regions, they can be traced through the Rhodesian plateau, and the eastern margin of the High Veld, and the hilly land between it and the Indian Ocean. Millet is the chief cereal planted by the natives, but maize, wheat, and other grains can be grown.

Except in this south-eastern region, for 8° to 10° on both sides of both tropics there is little or no rain at any season, the nights are cool and even cold, while the days are excessively hot, especially in summer, and the ranges of temperature, both diurnal and annual, are great (over 30° F.). There is a gradual transition from the bordering Savana, through poor grass lands, with scrubby mimosa and other gum-yielding trees, to the barren desert of the Sahara in the north (see pp. 18, 19) and of the Kalahari of the south (see pp. 195-197). The Nile forms one fertile strip across the former, and wherever water is available oases are found in both. Occasionally, after an exceptionally heavy rain, which may come in the course of years, some vegetation starts up for a brief life.

The extreme north and the south-west of Africa are almost as dry in summer as the deserts which they border. In winter they receive stormy winds from the westward which bring rain with them. The rain falls in the cold season. The plants are mainly evergreens with thickened leaves, or possess special water stores in bulbs, leaves, etc. (see pp. 218-219). This climate and vegetation is usually known as Mediterranean. The vine, olive, lemon, orange, fig, pomegranate, and many other fruits are characteristic (see pp. 6-9).

Animals.—The Sahara is one of the greatest barriers to the movement of men or animals in the world. The one-humped camel is the only animal which regularly crosses it (see p. 19). The animals in the extreme north resemble those of Europe. South of the Sahara a different type of animal prevails. Antelopes, zebras, giraffes, buffaloes, elephants, rhinoceroses, and other plant-eating animals and ostriches run on the Savanas; hippopotamuses and crocodiles live in the rivers; and lion, panther, hyena, leopard, and other beasts of prey prowl around (see pp. 155-158, 188-192). The natives have herds of cattle and fat-tailed sheep. In the dense forests monkeys of many species, including the almost men-like gorillas and chimpanzees, and innumerable birds and insects live. The mosquito, which appears to be the chief means of spreading fevers, and the tsetse fly, whose bite is fatal to horses, are among the pests of the lower lands (see pp. 202, 203). In the extreme south the merino sheep has been introduced, the ostrich is reared for its feathers (see p. 223); goats, cattle, donkeys, and horses are kept.

Races.—White men predominate north, black men south, of

the Sahara. There are fewer men of European descent in Africa than in any other continent, and these are found mainly on the Mediterranean seaboard and in the extreme south. They do not form more than about $1\frac{1}{2}$ per cent of the whole. The other white men in the north are the Berbers and the Arabs, the latter descendants of Asiatic invaders. The races, however, are not pure but mixed, often with negro blood.

Of the black men, the inhabitants of the Sudan are classed as true negroes, while those of the Congo basin, East and South Africa, are known as Bantus. The languages of the latter are all closely related, but the different tribes using these Bantu tongues do not all possess the same physical characteristics. There is some admixture of white blood in many of the Sudanese negroes, which differ among each other both in appearance and language. Swahili tends to be the *lingua franca* of Bantu Africa and Hausa of the Sudan and West Africa. Among the Sudan negroes the Hausa (see pp. 92, 93) and Fula may be mentioned, and among the Bantus the Zulus and Kafirs.

The Hottentot and Bushmen tribes of South Africa are distinct from the other negroes.

A number of dwarf men live in the tropical forest, of whom an account is given on p. 154.

In the eastern half of Madagascar Malay peoples have settled, of whom the most important are the Hovas.

Density of Population.—It is difficult to estimate the population of Africa. It is probably about 127,000,000. It is but sparsely peopled, with about 11 people to each square mile. The inhabitants are densest in the cultivated regions of the Sudan, and some West African centres, such as Lagos (see p. 66). In fertile Egypt and along the shores of Barbary, on the richer savanas bordering the equatorial forest, the population is denser than in the forests, and naturally the deserts are the most thinly peopled of all the tracts.

Political Divisions.—Egypt, Abyssinia in the great volcanic highlands, near the south of the Red Sea, and the negro republic of Liberia on the Upper Guinea coast, are the only independent states. The rest of Africa is under European domination. In North Africa, France controls the western part of the Sahara and parts of the western and central Sudan, but Britain the Anglo-Egyptian Sudan. Libya is Italian, and Marocco as well as Algeria and Tunisia are French. Small possessions on the

margin of French territory are independent Liberia; British Gambia, Sierra Leone, Gold Coast, Ashanti, and Nigeria, besides the British mandated territories of Togoland and Cameroons, and the French mandated territories of Togo and Cameroon; Spanish Rio d'Oro; Portuguese Guinea. On the margin of the Anglo-Egyptian Sudan are independent Abyssinia, French and British Somaliland, and Italian Eritrea and Somaliland. Africa, south of the Congo and Victoria Nyanza, is divided into the Belgian Congo, Portuguese West and East Africa, and the British territories which, with the mandated areas of Tanganyika and South-West Africa, extend from Lake Victoria to the southern coast. Madagascar and Réunion are French; Mauritius and other small islands in the Indian Ocean, British; the Cape Verde, Madeira, and Azores are Portuguese; the Canary Islands and Fernando Po, Spanish.

POLITICAL CONTROL OF AFRICA

Latest approximate Figures available in 1928.

	Square Miles.	Inhabitants.
British	3,738,000	52,000,000
French	3,130,000	31,000,000
Italian	1,219,000	2,000,000
Portuguese	927,000	7,000,000
Belgian Congo	918,000	8,000,000
Spanish	128,000	1,000,000
Independent	13,000	26,000,000
Total	<u>10,073,000</u>	<u>127,000,000</u>

THE BARBARY STATES

Marocco (219,000 square miles without desert = 4 Englands; 5,309,000 inhabitants) consists of the well-watered and fertile strip of land bordering the north-west coast, the drier and less fruitful foreland of the Atlas, and the wooded slopes of these mountains. Its boundary in the desert has not been definitely fixed. The physical characteristics and natural resources of this rich land are fully described in the extracts on pp. 5-9.

Marocco is a French Protectorate and is ruled by a Sultan. The capital is Fez (see p. 9), and the other inland towns are Marakesh, or Marocco City (see p. 11), and Mekinez. Tangiers, under international control, is the chief northern seaport on

the Strait of Gibraltar, and Magador, the chief southern one, is the port of Marakesh.

The oasis of Tafilet (see pp. 24-28) is the original home of the present reigning family in Morocco.

Ceuta is a Spanish fortress opposite Gibraltar, dominating the strait. The mountainous Rif country is Spanish.

Algeria (Northern Territory, 80,000 square miles; 5,522,000 inhabitants) consists of a strip of fertile, hilly land—the Tell—bordering the coast, above which rises the Tell Atlas, sinking in the south to a less fertile plateau, with shotts or salt lakes, bordered on the south by the Saharan Atlas. Southern Algeria is about 767,000 square miles, and contains 542,000 people. The climate and vegetation are described on pp. 15, 16.

For four centuries the Algerian pirates were the dread and scourge of the western Mediterranean. In 1830 the French took possession, and have gradually extended their domain to the confines of the desert. About 872,000 Europeans—chiefly French—have settled in the country, which is rapidly progressing.

Algiers (Alger), the capital (226,000), is the chief commercial and naval port. It is built on a series of fortified terraces, and consists of an old crowded Arab town and a newer one with wide streets and houses after the style of those of Paris. From Algiers the railway runs westwards, in the valley between the coast and Tell Mountains, by the Sheliff (Chélif) River to Oran, the western port. Oran (150,000) lies opposite Cartagena in Spain, and has many Spanish inhabitants. The railway east of Algiers runs to Constantine and its port, Philippeville, to Bona, and also by the Majerda valley to Tunis.

Constantine (93,000) is built on a great rock 1000 feet high, almost impregnable, and is famous for its manufactures, especially in leather, wool, and silver. Bona (Bône, the ancient Hippo Regius) (51,000) is an excellent port at the extreme east of Algeria.

Railways have been built southward across the Atlas system to the Sahara, towards the Figig oasis in the west, and to Biskra in the east.

Tunisia (48,000 square miles including desert = England; about 2,159,000 inhabitants), the Africa of the ancients, lies at the extreme east of the Atlas Mountains, and is bordered on

both north and east by the sea. The rivers Majerda and Jilma, the Shott el Jerid, and other salt lakes (see p. 21), occupy the three main furrows between the mountain ranges. The climate and vegetation, as in Algeria, are more favourable in the north than in the south. We may distinguish (1) the hilly, wooded Tell, with its meadows and maize-fields, (2) the sandy, coastal land, the olive-bearing region, anciently fertile, still potentially so, (3) the plateau, two-thirds occupied by cattle, alfa, and corn, (4) the barren Tunisian Sahara with a few oases.

Tunis, the capital (185,000), the outlet of the fruitful Majerda valley, is joined across the shallow gulf of Tunis by a ship canal to the Mediterranean. North of this gulf are the ruins of Carthage. Bizerta (20,000) is a strongly fortified naval station on the north coast, opposite Sicily. Sfax (270,000) also has a ship canal, five miles long, which makes it the chief port of southern Tunis. Kairwan is a sacred city of the Mohammedans with many mosques.

Italian Libia consists of Tripolitania (900,000 square miles, with a population of 570,000), and Cyrenaica (75,000 square miles, with a population of 195,000). Tripoli (60,000), the chief town and port of Tripolitania, lies on a coastal plain, formerly cultivated and again being developed by the Italians. It is the starting-place of many caravans. These cross the Sahara *via* Ghadames to Twat and Timbuktu, *via* Ghat to Kano in Nigeria, and *via* Murzuk, the chief centre of the oases collectively known as the Fezzan, to Lake Chad, and also eastwards to Siwa in Egypt. These oases produce dates and salt. Benghazi, the capital of Cyrenaica, has a small trade and sponge fisheries. A few caravans still pass between it and Kufra, and even Wadai.

EGYPT, THE EASTERN SUDAN, ABYSSINIA, AND ERITREA

Egypt (13,000 square miles without desert, 383,000 square miles with desert; population, 14,166,000; is an independent sovereign state. It consists of a narrow strip of fertile land ending in the triangular delta, watered by the annual floods of the Nile, regulated by vast irrigation works, surrounded by a sandy or stony wilderness almost impassable. The Nile valley varies in width from 5 to 6 miles in Nubia to 30 miles in

Egypt. A distributary of the Nile, the river of Josef, flows parallel to the main stream for many miles, and evaporates in a lake in the cultivated depression of the Fayûm (see p. 56). Three crops may be raised when irrigation is perennial. In the delta cotton, sugar-cane, rice, maize, and wheat are among the chief crops; in the Nile valley cereals and vegetables are most important. By great dams at Aswân, Asyût, and at the head of the delta the flow of the Nile is being better regulated and the area under perennial irrigation increased.

The chief city is Cairo (1,059,000), at the apex of the delta, which is described on p. 54. It is connected by rail (see pp. 51, 52) with Alexandria (570,000), the chief port of the Nile valley, which lies at the western end of the delta, on which Tanta, Zagazig, and other towns have grown up. A railway follows the Nile to Aswân at the first cataract (see p. 48).

Egypt contains some of the most gigantic works of man. The huge pyramids (see p. 54) and temples of the past are found near the Nile. Modern engineers have constructed the dams (barrages), already mentioned, and the great Suez Canal between Port Said and Suez.

The *Anglo-Egyptian Sudan* (about 1,014,000 sq. miles = ca. 20 Englands; population roughly estimated at about 7,000,000) extends 1300 miles from the southern frontier of Egypt to 5° N. In the north it is desert, with the exception of the narrow Nile valley. Above the junction of the White and Blue Nile (see p. 46) the rainfall is less scanty, but from the bend at Kodok 10° N. to the falls below Lado the Nile flows through a flat swamp, which in the wet season becomes a great lake. Masses of vegetation then float and accumulate in narrower or shallower parts of the river, forming the formidable barriers known as sudd (see p. 39). There is now a bridge over the White Nile connecting Khartûm and Omdurman. Below Khartûm, the great trade centre, the cataracts of the Nile interrupt navigation, but a railway has been built by Abû-Hammed, thence across the desert to Wadi Halfa, and another from Berber to Suakin and Port Sudan on the Red Sea. Except for falls at Lado and for the sudd, the river is navigable from Khartûm to the Albert Nyanza.

Abyssinia (about 350,000 square miles and 10,000,000 inhabitants) is an independent empire, situated in an almost inaccessible volcanic table-land about 8000 feet above the sea.

The climate and vegetation belts differ with the elevation, and may be termed the hot, temperate, and cold belts, which are comparable to those of Mexico.

The hot region has tropical products. The middle belt is more European in character, but its rainfall is in summer. Coffee, wines, wheat, and other cereals, and other useful plants are grown in these park-like regions. The colder higher regions have fewer trees, hardy cereals are cultivated, and mountain meadows afford pasture. The people are largely pastoral (pp. 42-45). Hides and coffee are the chief productions exported. The present capital, Addis Abeba, lies in the extreme south in Shoa, the province of the present emperor. For 260 years Gondar, near Lake Tana, was the chief town, and Aksum was formerly the religious capital. Adowa is the chief centre in the north. A railway from Jibuti in French Somaliland to Deré Dawa, near Harrar, has been extended to Addis Abeba.

Eritreu (46,000 square miles = England; 402,000 inhabitants) consists of the dry coastal lands which form the southern part of the west coast of the Red Sea. The chief centre is Massawa on a coral island close to the coast, from which short railways have been built to the foot of the plateau.

THE WESTERN SAHARA, SUDAN, AND GUINEA COAST

French West Africa

(2,747,000 square miles = 30 British Isles; 13,541,000 inhabitants.)

Nearly the whole of the *Sahara* (see p. 18), with the exception of the Libyan and Nubian deserts and the Spanish west coastal strip called the Rio de Oro, is nominally French. Its Berber and Arab inhabitants are described on pp. 27-30.

Its southern and western confines form the *Colonies of the Niger* and *Mauretania* (617,000 square miles, 1,500,000 inhabitants). French Sudan has an area of 360,000 square miles with a population of 2,634,000, and the colony of Upper Volta an area of 142,000 square miles, and population of 3,240,000. Bammako, on the Upper Niger, is joined by railway to the navigable Senegal. Timbukto (see p. 96) is at the northern bend of the Niger.

Senegal (74,000 square miles = $1\frac{1}{2}$ Englands; 1,318,000 inhabitants) is the northern region of summer rains, produces

earth-nuts, gum, and rubber, which are shipped from St. Louis, at the mouth of the Senegal River, or Dakar, south of Cape Verd. A railway from St. Louis through Dakar has been extended to Kayes on the Senegal, from which a railway runs for 350 miles to Kulikoro on the Niger.

French Guinea (92,000 square miles = 2 Englands; 2,133,000 inhabitants) lies between Portuguese Guinea and Sierra Leone. It exports rubber, palm oil, and nuts from Konakry, which has been connected by railway with the Upper Niger at Kurussa.

The *Ivory Coast* (121,000 square miles = $2\frac{1}{2}$ Englands; 1,724,000 inhabitants) exports fish, mahogany, and palm oil and nuts, chiefly exported from Grand Bassam, built on a sand-spit which shuts off a large lagoon from the coast (cf. Lagos and other lagoons of Bight of Benin, pp. 66-69). The capital is Bingerville.

Dahomey (42,000 square miles = $\frac{4}{5}$ England; 979,000 inhabitants) has Porto Novo (25,000) for its chief centre, and exports chiefly palm kernels and palm oil.

The *Mandated Territories* of Togo and Cameroon, which formerly belonged to Germany, are under French administration.

Togo (21,000 square miles; 574,000 inhabitants) has its capital at Lorne. It chiefly exports palm oil and nuts.

Cameroon (166,000 square miles; 1,878,000 inhabitants) has its seat of government at Yaoundé. The chief products are tobacco, palm oil, almonds, rubber, timber, cacao, and ivory.

British West Africa

(450,000 square miles = 9 Englands; 22,500,000 inhabitants.)

Gambia (4130 square miles = Devon or Lincolnshire; 210,000 inhabitants) consists of both banks of the lower half of the Gambia River. Bathurst (8000) is the chief town. The chief export is ground nuts.

Sierra Leone (31,000 square miles = $\frac{2}{5}$ England; 1,500,000 inhabitants) was originally founded as a settlement for freed slaves, of which the name of the capital, Freetown (44,000), is a reminiscence. Palm oil, kernels, kola, rubber, piassava, and ginger are the chief exports. Full accounts of native industries are given on pp. 61-63, 69-74, 76-77. A railway runs over 200 miles eastwards from Freetown to near the Liberian frontier.

The *Gold Coast* and *Ashanti* and *Northern Territories* (80,000

square miles = $1\frac{2}{3}$ England; 2,078,000 inhabitants) exports cocoa, palm oil and kernels, kola, rubber, and timber from the heavily wooded interior. Sekondi, in the west, has increased in importance, since the railway was started, which runs through Tarkwa to Kumasi, the chief town of Ashanti. A short line runs northwards from Accra (pp. 63-66).

Accra (38,000), the capital, Cape Coast Castle (15,000), Sekondi (10,000), and Takoradi, with its new deep harbour, are the chief ports.

The British mandated area of *Togoland* is attached to the Gold Coast.

Nigeria (about 335,000 square miles = 8 Englands; population estimated at 18,765,000) lies between the Bight of Benin and Lake Chad, and includes the river Niger below Ilo.

Southern Nigeria may roughly be defined as the Niger delta, across which innumerable distributaries flow to the sea, each with its bar, each with its port within it. The description of the Benin River on p. 67 is typical. The area is about 78,000 square miles and the population 8,532,000. Lagos (73,000 inhabitants) (see p. 66) is the greatest port in West Africa, and the seat of the central government. It is connected with the interior by a railway which runs through Abeokuta to Ibadan, and joins the line from Baro *via* Bida and Zaria to Kano. Asaba is on the main stream at the apex of the delta, and Akasa, Bonny, and Port Harcourt are on the coast of the delta. Port Harcourt, in the Calabar District, has a good harbour, and an important railway has been built northwards from it to Kaduna crossing the Benue by train ferry at present, but a bridge is being built.

Northern Nigeria includes the most fertile and densely peopled parts of the Sudan, including Sokoto, the empire of the Mohammedan Fulas. Cotton, indigo, millet, and many other plants are cultivated by the agricultural tribes, especially the Hausas, who are also famous for their leather, glass, metal work, and as weavers, dyers, and even canoe-builders. The Hausas are the traders of this region (see p. 92). The Fulas, who conquered them early in the nineteenth century, are pastoral warriors.

The chief trading centres are Sokoto (50,000), Kano (100,000), Zaria (65,000), and Bauchi, built where there are tinfields. Rabba, Baro, and Lokoja on the Niger and Yola on the Benue are the chief river ports (see pp. 93-95).

The chief exports of Nigeria are palm oil and nuts, ground nuts, tin, cocoa, and cotton.

The mandated area of the *Cameroons* (31,000 square miles, 660,000 inhabitants) is attached to Southern Nigeria.

Portuguese Guinea (14,000 square miles = $\frac{1}{2}$ Scotland; 770,000 inhabitants) includes the Bissagos Islands. The chief port is Bissao at the mouth of the Rio Grande. Bolama is the capital.

Liberia (43,000 square miles = $\frac{4}{5}$ England; 2,000,000 inhabitants) was founded by American philanthropists for freed American slaves. It is an independent republic, of which Monrovia (10,000) is the capital. Coffee, palm oil and kernels, piassava fibre, rubber, and cacao are among the exports.

THE CONGO AND ANGOLA

French Equatorial Africa (975,000 square miles = 19 Englands; 3,127,000 inhabitants), extends from the Ubangi-Welle-Congo to beyond Lake Chad. Rubber, timber, oil, and ivory are the chief products utilised in the Congo provinces. The natives cultivate manioc, minerals are said to be abundant, and plantations of cacao, coffee, and vanilla have been started. Libreville is the capital and chief port in the Gabun colony. A railway is being built to the Congo. Loango, in the south, is the port of Brazzaville, the capital of the Middle Congo Colony, on Stanley Pool.

The *Belgian Congo* (918,000 square miles = 18 Englands; 8,500,000 inhabitants) consists of most of the basin of the Congo south of the Ubangi-Welle. Over 900 miles of railway are being built from Stanleyville. Ivory and rubber are sent by water to Leopoldville, on Stanley Pool (see pp. 137, 138). Oil is carried there by a pipe from Matadi. From Stanley Pool a railway, 250 miles long, runs to Matadi on the navigable estuary of the Congo, and thus avoids the numerous rapids (see p. 137). Boma, farther down the estuary, on the north bank, is the capital. Full descriptions are given of the Great Forest (p. 152), the animals (see p. 155), the peoples (p. 158), the political changes (p. 159). Oil palms, rubber, coffee, cacao, and tobacco are cultivated in the plantations which have been started. Copper mines are very important in the Katanga area, and gold and diamonds are also mined.

Angola is a West African possession of Portugal (485,000 square miles = 10 Englands; 4,100,000 inhabitants), which lies

between the Congo and Kunene rivers. It consists of a narrow and rather arid coastal plain, above which the land rises in terraces to a comparatively cool and healthy table-land. The oil-palm and rubber are found in the north and in the valleys of the Congo basin. Coffee and sugar plantations have been formed round the railway, which runs a considerable distance inland from São Paulo do Loanda (commonly Loanda), the chief port and capital. Another railway has now reached the frontier of Belgian Congo, from Lobito Bay near Benguela.

EAST AFRICA

French Somaliland (5,700 square miles ; 56,000 inhabitants) lies south of Eritrea. It is of little importance save for strategic and commercial reasons. The port and capital of Jibuti (8,000) exports coffee, hides, and ivory, and is that by which much Abyssinian trade is carried on. A railway is built to Addis Ababa.

Italian Somaliland (190,000 square miles = 4 Englands ; 900,000 inhabitants) is a strip of rather arid land south of Cape Guardafui, known as the Benadir coast. The administrative centre is the port Mogadishu.

British Somaliland (68,000 square miles = 2 Irelands ; population roughly estimated at 344,000) lies between French and Italian Somaliland on the south of the Gulf of Aden. The land is arid, and flocks and herds of the Somalis, a pastoral nomadic people (see p. 108), are the chief wealth. Berbera (30,000) supplies Aden, which lies opposite to it, with food. Zaila, farther west, is the rival of Jibuti for the Abyssinian trade (see pp. 104-109).

Sokotra is an island outlier of Somaliland. It is an arid plateau, producing dates, gums, live stock, and butter, exported to Aden of which it is a dependency.

British East Africa (472,000 square miles = nearly 10 Englands ; population estimated at 9,200,000) consists of Kenya Colony and protectorate, Uganda, and the islands of Zanzibar and Pemba.

Zanzibar (see p. 115) is a sultanate with a British Prime Minister. It consists of Zanzibar, Pemba, and smaller islands, famous for their cloves. It is the great *entrepôt* centre of both British East Africa and Tanganyika territory.

Kenya Colony and Protectorate lie between Italian Somaliland and Tanganyika territory, and ascends by a series of terraces from the coast to the Kikuyu escarpment (see pp. 111, 123).

The coast is hot, moist, malarial, and productive, but farther inland the climate is cooler and drier, and in the higher regions grass lands prevail on which the semi-nomadic, pastoral, and military Masai (see p. 122) wander with their herds. Mombasa (see p. 114), the chief port, is on an island, and from it a railway is built to Kisumu on the Victoria Nyanza (see p. 124). Plantations have been formed on the higher lands round Nairobi, the capital.

Uganda (see p. 126) is a protectorate which extends from Lake Rudolf to the Albert and Albert Edward Nyanza, and from the middle of the Victoria Nyanza to 5° N. The average elevation is over 4000 feet, but the lower valleys are marshy and malarial. In the west the oil-palm and banana are cultivated, but cotton is the chief crop, coffee, rubber, and cacao are also grown (see p. 128). The chief British centre is Entebbe, the native capital Mengo. The eastern region of the Nandi Plateau is lofty and healthy.

Tanganyika Territory is under a British mandate (373,000 square miles ; population estimated at 4,107,000). It consists of the coastal plain between the Umba and Rovuma rivers and the terraces which rise between it and Lake Tanganyika. There are plantations of sisal fibre, cotton, and coffee near the coast, and valuable timber in the interior. Dar es Salaam is the capital chief port, but neither it nor Bagamoyo, opposite Zanzibar, nor Tanga, opposite Pemba, are available for large vessels. Railways are built from Tanga to Korogwe and Mombo ; and from Dar es Salaam to Lake Tanganyika. Mwanza is a port on Victoria Nyanza and Ujiji (see p. 144) on Lake Tanganyika (pp. 143, 144).

Mozambique (Portuguese East Africa, 428,000 square miles = 8 Englands ; population estimated at 3,120,000) stretches from the Rovuma to beyond Delagoa Bay. It is divided by the Zambezi into a northern and a southern part. The northern part resembles Tanganyika territory in structure and productions. The chief ports are Mozambique and Quilimane, on the Kwakwa, tributary of the Zambezi, and formerly the port for that river before the utilisation of the Chinde mouth for navigation. In the south Beira (p. 204), on the Pungo River, is the terminus of a railway, which climbs by the Massi Kessi gold mines in Portuguese territory to Salisbury in Rhodesia, and replaces the ancient port of Sofala, whose harbour has silted up.

Lorenzo Marquez the capital, is an even more important centre on Delagoa Bay, an excellent harbour protected by two islands.

SOUTH AFRICA

	Square Miles.	Inhabitants.
Cape of Good Hope	277,000	2,781,000
Natal	35,400	1,429,000
Orange Free State	50,400	628,000
Transvaal	110,400	2,087,000
Total Union of South Africa	473,000	6,928,000
Basutoland	11,700	495,000
Bechuanaland Protectorate	275,000	152,000
Swaziland	6,700	112,000
Southern Rhodesia	149,000	873,000
Northern Rhodesia	287,000	1,140,000
Nyasaland	37,800	1,291,000
Total British South Africa	1,242,400	10,991,000
South-West Africa	311,800	258,000

Nyasaland, formerly the *Central African Protectorate*, includes the Shiré Highlands (see p. 176), and the plateau to the west of Lake Nyasa. Europeans have formed tobacco, coffee, cotton, tea, and other plantations in the Shiré Highlands, where Blantyre is the chief settlement and Zomba the capital.

Northern Rhodesia. The capital is Livingstone on the Zambezi. The railway runs from it through Broken Hill to the Katanga copper region of Belgian Congo. Maize, cotton, tobacco, and other products are increasing in importance. Gold, lead, zinc, and copper are mined. The Stevenson Road joins Lakes Nyasa and Tanganyika.

Southern Rhodesia includes the Matabili plateau, where Europeans can live healthily over about 4,000 feet. The railway from Beira runs through Salisbury, the capital, and at Bulawayo joins that from Cape Town, which crosses the Wanki Coalfield to Victoria Falls and Northern Rhodesia. The chief exports are gold, asbestos, chrome ore, copper, animals, maize, and tobacco.

The *Transvaal* lies between the Limpopo and the Vaal. It is low, hot, and unhealthy in the north and east, but cooler, drier, and healthier on the plateaus of the centre, west, and south. The natural resources are very great (see p. 206). Stock rearing

has hitherto been the chief occupation, but agricultural possibilities are great in the north and east. Gold is widely spread, and attracted a large population to the country in the last decade of the nineteenth century, especially at Johannesburg (see p. 209), the chief centre on the Witwatersrand. Pretoria, the capital, and seat of the Union Administration, lies to the north. Railways run from these two centres to Delagoa Bay by Middelburg, famous for its coal, and the Barberton gold mines; to Durban, in Natal, by Heidelberg and Laing's Nek; northwards to Pietersburg; southwards to the ports of the Cape Province through the Orange Free State; eastwards to Fourteen Streams on the Cape to Rhodesia Railway.

The *Province of Orange Free State* lies between the Vaal and the Orange rivers. Like the Transvaal, it is primarily a pastoral land, with a richer agricultural area in the east. Excellent wheat is raised round the Caledon River. Bloemfontein, in the centre of the Province, is the capital. The finest diamonds in South Africa are found at Jagersfontein.

Natal (see p. 210) consists of (1) a hot, moist, coastal region, producing sugar, tea, acacia bark, maize (mealies), and subtropical products, (2) a more temperate and wooded intermediate land, where all kinds of European plants can be grown, and (3) a higher, cooler, mountain region, famous for its pastures, on which sheep, goats, and cattle feed. Durban, on Port Natal, has been made an excellent harbour, to which the produce of the coastal plantations is brought by railways. From it a line runs through Pietermaritzburg, the capital, to Ladysmith, where it diverges to Harrismith in the Orange Free State, and to the Witwatersrand gold-field in the Transvaal, through the coal fields of North Natal, where Dundee and Newcastle are the chief centres.

Basutoland (see p. 210) has been called the Switzerland of South Africa. It is a mountainous, inaccessible, fertile region, from which Europeans are excluded, and where the natives have made great progress under French missionary and British administrative influence. Maseru is the chief centre.

The *Province of the Cape of Good Hope*.—Part of this area is arid and unproductive, but the south-east and south-west are fertile. These two regions have very different climates, the south-east receiving most rain in summer, and the south-west in winter. Maize (mealies) and kafir corn are

the chief crops of the east. Wheat is grown on the lowlands of the Cape peninsula in the south-west. Vines and other Mediterranean fruits flourish in the south-western hills. The merino sheep and Angora goat yield much wool, the most important production of the colony. Ostriches (see p. 223) are reared for their feathers, especially in the east. Minerals are not abundant, copper is mined south of the Orange at Ookiep, joined to Port Nolloth by a railway; coal is found in the Stormbergen; and (see p. 226) diamonds in the volcanic pipes of the Kimberley district, near the confluence of the Vaal and Modder. Except Kimberley and the adjoining Beaconsfield, the chief towns are on the coast. Cape Town (see p. 228), the capital on Table Bay, is the nearest good port to western Europe, and from it the railway has been built across the semi-desert Karroo to Kimberley and Mafeking, and thence to Bulawayo (see p. 230). It is the seat of Legislature of the Union. Near Cape Town is Simonstown, a naval station, or Simon's Bay. Port Elizabeth (see p. 228) on Algoa Bay and East London are the termini of lines running to the Orange Free State, with junctions to the Bulawayo railway. Port Elizabeth has a great trade in wool, and both it and East London have important manufacturing industries. Stellenbosch, Paarl, and other small towns of the west and south have a Dutch aspect, whereas Grahamstown and some of the eastern towns are more English in appearance. The west, south, and the Karroos are essentially Dutch in population; the east has a great proportion of English, Scottish, and German inhabitants. Everywhere, as in the rest of South Africa, the non-European element far outnumbers the European.

The *Bechuanaland Protectorate* (see p. 199) is semi-desert, with a considerable supply of underground water which may render it of greater value in the future.

South-West Africa is under a British mandate. It lies between the Orange and the Kunene rivers, and sends a curious tongue to the Zambezi. It is very arid along the coast, but the higher plateaus are less so. Pastoral and mining pursuits are likely to be the chief occupations for a long time to come. The chief exports are diamonds and copper. Windhoek, the chief centre, is being joined to Swakopmund by a railway. The latter port is not so good as *Walfish* or *Walvisch Bay*.

EAST AFRICAN ISLANDS

Madagascar (241,000 square miles = $4\frac{1}{2}$ Englands; 3,621,000 inhabitants) is the sixth or seventh largest island (see p. 241). It is low in the west, and gradually rises to a long plateau which is loftiest in the east, and sinks in steep escarpments to the low eastern coastal plain fringed with lagoons. The east side receives heavy rains especially in summer, and is densely forested. The rainfall is much less in the west where savana lands prevail. The Hovas and other inhabitants in the east are of Malay origin, the Sakalavas and other tribes of the west are related to the African Bantus. Under the influence mainly of protestant missionaries, the Hovas of the plateaus have been christianised. The island is now a French possession.

Its chief productions are rice, manioc, sugar, coffee, cotton, butter, beans, rafia fibre, rubber, and various forest products. The western peoples are more pastoral. The mineral wealth is very great, especially in gold, graphite, phosphates, precious stones, and mica.

The chief town is Antanánárivo on the plateau, which is reached from the port of Tamatave on the east coast. A railway has been constructed from the capital to Tamatave, and also to Autsirabe. A third railway now runs northwards from Moramanga.

Noisi-Be and Ste. Marie, as well as the Mayotte and Comoro Islands in the north of the Mozambique Strait, are also French.

Réunion (nearly 1000 miles in area, with 175,000 inhabitants) is a beautiful volcanic island, clad with rich, tropical woods, in the clearings of which sugar, vanilla, coffee, cacao, and other tropical and subtropical plants are cultivated. The chief town is St. Denis. The island belongs to France.

St. Paul, Amsterdam, and Kerguelen Islands, in the Indian Ocean, are also French.

Mauritius (970 square miles, 186,000 inhabitants) (see p. 245) resembles Réunion in its scenery and productions. It is of volcanic origin, but is surrounded by coral reefs. The chief productions are sugar, coffee, and manioc, and rum is manufactured. The chief port and capital is Port Louis. This island and the Seychelles belong to Britain.

The *Seychelles* are small coral-girt, volcanic islands, producing coco-nuts exported from Victoria on Mahé, the largest island.

Rodriguez is a fertile volcanic island east of Mauritius.

The *Chagos or Oil Islands* are a scattered group, noted for their coco-nuts. A British coaling station has been established on the coral island of Diego Garcia.

WEST AFRICAN ISLANDS

St. Helena is a volcanic island described on p. 240, notorious as the prison of Napoleon.

Ascension is also volcanic. It is the resort of the sea turtle (see p. 238).

Fernando Po, a fertile volcano between the Bights of Benin and Biafra, is a Spanish possession, as is the islet of Anno Bom.

Principe and São Thome are smaller islands to the southwest belonging to Portugal.

The *Cape Verde Islands* (see p. 236) are also Portuguese. The climate is rather dry, but castor oil, coffee, oranges, maize, and sugar are among the products.

The *Canary Islands* (2800 square miles, nearly 520,000 inhabitants) consist of five larger and two smaller islands (see p. 234). Of the former Teneriffe, with its great volcanic peak, and Grand Canary, with its capital Las Palmas, are most frequently visited by invalids. The islands have a mild and delightful climate, and produce many grapes and bananas.

The *Madeira Islands* (see p. 233) are also volcanic, and have an even finer climate than the Canaries. Sugar and wine are the chief productions. Funchal on the Island of Madeira is the capital. The islands are Portuguese.

The *Azores* are also Portuguese islands of volcanic origin, of which the largest is San Miguel. Pine apples, oranges, and sugar are exported from Porto Delgado, the capital.

NOTE.—The figures for areas, heights, and populations are with few exceptions merely approximations.

A DESCRIPTIVE GEOGRAPHY OF AFRICA

INTRODUCTORY

Africa

AFRICA, speaking generally, is a vast, ill-formed triangle. It has no peninsulas ; it has almost no islands or bays or fjords. But three great inlets, three mighty rivers, piercing it to the very heart, have been allocated by a kind Nature, one to each of its solid sides. On the north is the river of the past, flowing through Egypt, as Leigh Hunt says, "like some grave mighty thought, threading a dream" ; on the west the river of the future, the not less mysterious Congo ; and on the east the Zambezi.

The physical features of this great continent are easily grasped. From the coast a low scorched plain, reeking with malaria, extends inland in unbroken monotony for two or three hundred miles. This is succeeded by mountains, slowly rising into a plateau some 2000 or 3000 feet high ; and this, at some hundreds of miles distance, forms the pedestal for a second plateau as high again. This last plateau, 4000 to 5000 feet high, may be said to occupy the whole of Central Africa. It is only upon the large scale, however, that they are to be reckoned plateaus at all. When one is upon them one sees nothing

but mountains and valleys and plains of the ordinary type, covered for the most part with forest.

PROF. HENRY DRUMMOND. — *Tropical Africa*. Hodder and Stoughton.

By permission of Messrs. Hodder and Stoughton.

The Great Rift Valleys of Africa

In an examination of a map of Africa, one of the first points likely to be noticed is the number and size of its great lakes. Anything beyond a most casual examination of the map shows that the lakes are all grouped in the eastern tropical region, and that they are here developed in two forms. There are those such as the Nyanza and Lake Mweru, which are round in shape and have low shores, and those which are long and narrow in shape and have high precipitous shores, such as Tanganyika, Nyasa, and Lake Rudolf. Further examination, moreover, shows that the lakes are not distributed hap-hazard, but on a certain definite plan. The long ones are arranged in two lines, which pass on either side of the Nyanza and meet at the north end of Lake Rudolf; thence a line of lake-dotted lowland, in places below the level of the sea, runs up to the Red Sea. But the Red Sea itself presents exactly the same type of structure; it is long and narrow, and, excluding some strips of coast deposits, has similarly high, steep shores. From its northern end the Gulf of Akaba leads to another valley, margined by deep high walls, and travelling along it we come to another lake, situated in a deep depression, and a river in a long narrow valley. These are the Dead Sea and Jordan Valley, which continue the type of structure of the East African lake chain, till it ends off in the deserts of Northern Syria. From Lebanon, then, almost to the Cape there runs a deep and comparatively narrow valley, margined by almost vertical sides, and occupied either by the sea, by salt steppes, and old lake

basins, and by a series of over twenty lakes, of which only one has an outlet to the sea.

PROF. J. W. GREGORY.—*Geographical Journal*, October 1894.

By permission of Prof. Gregory and of the Royal Geographical Society.

This is from the first of three important papers by Professor Gregory on the Physical Geography of British East Africa, *ibid.*, October, November. December, 1894. The structure of the rift valleys is fully discussed in Prof. GREGORY's *Great Rift Valley*. Murray.

Diversity of African Landscape

Africa is about three times larger than Europe in its extent, and is infinitely more varied. You have the desert of deserts in the Sahara, you have the steppes of Eastern Russia in Masai Land and parts of South Africa, you have the Castilian uplands in Unyamwezi, you have the best parts of France represented by Egypt, you have Switzerland in Toro, the Alps in Ruwenzori, you have Brazil in the Congo basin, the Amazon in the Congo River, and its immense forests rivalled by the Central African forest.

SIR H. M. STANLEY.—*In Darkest Africa*. Sampson Low.

By permission of Sir H. M. Stanley and Messrs. Sampson Low and Co.

I.—THE BARBARY STATES

Marocco

MAROCCO, El Maghreb el Aksa (the extreme west), as the Moors call it, the sole independent Mussulman state of North Africa, is a country whose superficial area has been variously stated. The ordinary estimates of 220,000 and 250,000 square miles must be considered as being over the mark, including as they do large tracts which are quite outside the Sultan's authority, and which cannot therefore be deemed properly within the Empire. The frontiers of Marocco, as Said Pasha said of those of Egypt, *sont très élastiques*, and advance and recede according to the power of individual Sultans. The most convenient boundary line to the south, and the one which probably best describes the limits of the Sultanate at the present moment, is the Atlas chain, but this would exclude a large part of the country generally included under the name of Marocco.

The coast-line is of great extent, as a glance at the map will show, but the shore of the Atlantic is flat and sandy, and entirely without harbours, unless we except the so-called port of Mogador and the mouths of the Sebu, Bu-regreg, and Um-er-Rebia rivers. All of these last, however, have dangerous bars, and are at best navigable for ships of small burden only. Tangier, which has advantages both of situation and the anchorage afforded by the bay, must always be the chief outlet of trade.

The climate of Marocco, hardly to be surpassed any where, is beyond question the best in North Africa. Cooled on one side by the fresh Atlantic breezes, on the other the everlasting snows of the Atlas form a bulwark against the burning sand-winds of the Sahara, such as neither Algeria nor any other country on the south Mediterranean sea-board possesses. Hence the heat is never intolerable, and not only in climate, but also in its water-supply and the area of cultivated land, Marocco has the advantage over the French colony.

The population is supposed to be somewhere about 6,000,000, probably an over-estimate, though it is a ridiculously small number compared with the area and the food-producing power of the country. Nevertheless, famine, wars, disease, and oppression are bearing their legitimate fruits, and the numbers are steadily on the decrease, as is shown by the innumerable ruined towns and buildings, the waste land and gardens, and the absence of new ones.

The history of Marocco for the last three centuries is a sad story of gradual debasement and decay: the records of the latter-day Moorish empire are the ruin and desolation that everywhere meets the eye, the poverty, misery, and oppression of the mass of the population,—a shameful tale of suffering and wrong that are written in letters of blood throughout the land.

H. E. M. STUTFIELD.—*El Maghreb*. Low.

By permission of Messrs. Sampson Low and Co.

For the decadence of Marocco, see also THOMSON, *Travels in the Atlas and Southern Morocco* (Philip), pp. 436-40.

The Resources of Marocco

Of the material resources of Marocco it is difficult to say too much. Even under existing conditions, a great portion of the territory is extremely fertile. The two natural disadvantages with which it has to contend



A MARKET IN SOUTH MAROCCO.

are, occasional deficient rainfall and the ravages of locusts. For the first, the remedy is to be sought in irrigation. The unfailing streams from the Atlas already serve to a limited extent, but the area of productive land might by intelligent management be very largely increased.

With an almost unequalled climate, there is scarcely any one of the productions of the warmer temperate and sub-tropical zones that may not here be obtained. Besides grain, the country now supplies large quantities of olive oil, dates, oranges, and almonds, with a little cotton. The latter may be largely increased ; and there seems to be no reason why coffee, tea, sugar, indigo, and other valuable exotic produce should not be raised in the southern provinces.

There can be no doubt of the existence of mineral wealth in the Great Atlas. The forests of the Atlas would, if saved from wanton destruction, be a further important source of national wealth.

HOOKE and BALL.—*Tour in Morocco and the Great Atlas.*
Macmillan.

By permission of Messrs. Macmillan and Co. Ltd.

Vegetation of North Morocco

It was on the slopes of the Jebel Kebir, where the stony ground is almost exclusively occupied by a dense mass of small shrubs, few of them rising more than three or four feet from the ground, but nearly all covered with brilliant flowers, that we first began to seize the really characteristic feature of the North Morocco flora. A great variety and abundance of flowering perennials of shrubby habit is, indeed, a distinguishing feature of the whole Mediterranean region ; but very little observation was needed to show that we were here in that well-marked division that includes Southern Portugal, South-western Spain, and the opposite corner of Africa. This may be called for distinction the Cistus and Heath region ; for though most of the same kinds of Cistus and Helianthemum extend as far as the south of France, and many species of

heath inhabit the Atlantic coasts of Europe as far north as Connemara, it is only here that both these tribes flourish together and give a prevailing character to the vegetation. Most conspicuous of all is the gum-cistus, which in the Sierra Morena and the adjoining parts of Spain and Portugal obtains such predominance that for twenty miles together one may ride through a continuous thicket where the peculiar scent of the gum that covers the leaves and young branches is never absent.

The scarcity of trees in this country is mainly due to the mischievous interference of man. The same ignorant greed of the herdsman, who, to procure a little meagre herbage for goats, sets fire to wide tracts of brushwood, that has nearly reduced whole provinces of Spain to a nearly desert condition, has been equally busy and equally effectual in Marocco. The evergreen oak, which might produce much valuable timber, is the chief indigenous tree of this country ; but, except on the rocky western declivity of the hill above Cape Spartel, few here arrive at a moderate growth, and the same is true of the Portuguese oak. The latter, indeed, never attains a considerable stature ; but, where preserved from damage, it forms thickets some 20 or 30 feet in height, and, if duly protected, would help to preserve the hilly districts of this region from being annually parched by the summer sun.

HOOKER and BALL.—*Tour in Marocco and the Great Atlas*
Macmillan.

By permission of Messrs. Macmillan and Co. Ltd.

Fez

In a hollow in the hills lies Fez, an Arabian city, in a valley of North Africa. A river running through the centre of the town furnishes water for many fountains, for gurgling water, so cooling in its tone, is very dear to the Arab, who thinks still water is unhealthy. This river also furnishes power to grind the native cereals. . . . The charm and novelty of Fez is its narrow shop-lined streets,

teeming with people. Here is the grease and oil vendor in his eight-foot-wide shop with his wares on view. Here comes the donkey loaded with a dark greasy-looking mixture which you dodge. It looks like a poor quality of motor grease, but it is black soap. Next is a restaurant where meat-balls are frying, while a steady rhythmic noise turns out to be made by a seated man with a long cleaver chopping meat preparatory to cooking it.

Grape vines, the trunks of which in many instances are 6 or 8 inches in diameter, are trellised over the street to furnish shade, and in other places light reeds are fastened upon a supporting trellis to afford protection against the sun, which in parts of Marocco is spoken of as "The Enemy."

The streets are very crowded with donkeys, horses, sheep, dogs, mules, and people that push you out of the way if you fail to respond to the cry "Belak," or "Attention."

PAUL E. VERNON.—*Morocco from a Motor Car*, 1927. A. and C. Black, Ltd.

Across the Plateau of Marocco

At an elevation of about 700 feet we found ourselves on the first step of terrace which raises the traveller to the plateau of Southern Marocco. Here the step forms a wide plain stretching in low undulations, till, twelve miles eastward, it ends at the base of the second step, which rises abruptly like a low range of hills. This great plain was one almost continuous field of barley in various stages of growth, from the absolutely green to the ripe gold, where already busy groups of reapers were at work cutting off the heads of the grain with sickles.

The second march led us gradually by a waterless defile to the top of the plateau, at a height of 1500 feet, to find the same monotonous landscape presented to our view, though eastward some irregular hill masses limited the

green and yellow undulations. We ambled on the third day over the same treeless plain, which became, as we proceeded eastward, less fertile, and consequently less cultivated. Gradually, too, as we approached the mountains of Rahamna, which for two days we had seen looming up before us, the country began to belie its name of "red." We soon reached the end of the great plain we had travelled over for two days, and entered a series of very rocky, rugged hills, which run into peaks and pyramids and a picturesque variety of other forms.

After marching some three hours over rocky passes, and up and down irregular, desolate, uninhabited defiles, we entered a more even country, though here and there, to right and left, rose up sharp ridges of bare, jagged rock, which, if they served to add to the scenic effects, also helped to accentuate the air of grey barrenness and desolation which brooded over the landscape. All morning our route had trended suspiciously to the south, and the gravest doubts passed through my mind as to the existence of the second route to Demnat.

But all doubts as to our situation were speedily set at rest when, turning the shoulder of a hill, the Atlas range, the plain of Morocco, and the city itself burst upon our view.

JOSEPH THOMSON.—*Travels in the Atlas and Southern Morocco.*
George Philip and Son.

By permission of Messrs. Philip and Son.

The City of Morocco or Marakesh

Our first impressions of the city of Morocco, this southern capital of the empire, were those of unmixed disappointment. As we wandered through street after street and lane after lane, enclosed by red clay-built walls and houses of meanest aspect, we saw much indeed of the havoc, but very little of the splendour of the East. At every step we found evidence of a nation on a down-grade slide, of a people who had lost all earthly hopes and aspirations and lived under the most grinding oppression and tyranny.

Marocco was a city grown slattern, very much cut out at elbows and utterly careless of its personal appearance. Yet, with all its air of meanness, as we got rid of our preconceived notions, it again began to grow upon us. In the most unexpected places, often amidst tumbling ruins and all the signs of rapid decay, we were continually attracted by the sight of interesting examples of Moorish workmanship. Here it was a fountain, on which the artist had lavished all the wealth of his oriental imagination, and shown all his manipulative skill in covering it with stucco or wood-carved arabesque, with intricate tile-work and brilliant colours. There it was the doorway of a mosque, horseshoe-shaped and overhung with effective moulding.

We got delightful glimpses of mosque interiors too, all the more delightful because partaking of a spice of danger. These displayed beautiful wall decorations, Moors at prayer in the subdued light near the mihrab, and cool shady colonnades surrounding marble-paved courts where sparkling fountains cooled the air and invited the faithful to make themselves clean before venturing into the more sacred precincts.

It is not, however, to its architectural features that Marocco owes its special charm. As in all oriental lands, its most picturesque effects lie in its people and its street scenes. The very beggars carry their rags with such an air, they appeal to the passer-by in such a high-flown and picturesque language, that they become not only objects of compassion, but subjects for the artist. The women, swaddled in their absurd blanket-like haiks, carry about with them all the charm and mystery of the forbidden and the unseen—and yet not quite unseen either, for those beautiful eyes of theirs, sparkling with all their liquid brilliancy, between black-tipped eyelids and long glossy eyelashes, transfix the gaze of the onlooker and fire his imagination, till he sees not only beautiful eyes, but face and form. Not least attractive are the portly Moors themselves, draped in their toga-like creamy-coloured haiks, gliding along with a holy assurance of paradise in their

faces, while the weather-beaten Berbers, from the Atlas, the gaunt, fierce-eyed Arabs from the desert, and the slinking Jew, all form effective elements in the scene.

It was in the purely business part of the town, however, that we found most to admire. Motley throngs of buyers, busy workmen, and idle wayfarers, crowded the narrow thoroughfares, and, with the quaint box-like shops on either side, formed an exhaustless vista of interesting scenes.

JOSEPH THOMSON.—*Scottish Geographical Magazine*, April 1889.

By permission of Prof. Gregory and of the Royal Scottish Geographical Society.

See also THOMSON, *Travels in the Atlas and Southern Marocco*, chap. x ; and HOOKER and BALL, *Tour in Marocco and the Great Atlas*, p. 126.

In the Heart of the Atlas

As we penetrated deeper and deeper into the heart of the mountains, the glen became more savagely picturesque, the mountains more and more lofty, and but scantily clad with the omnipresent *Callitris* and juniper, evergreen oak and gum cystus. Our route was varied enough in all conscience. At one moment we were winding round great precipices by the merest ribbon of a pathway, overhung by great rocks above, and looking down on a dangerous abyss below ; at another we were marching up the bed of the turbulent stream. Here the glen opened slightly out, where friable shales predominated, there narrowed into an impassable gorge or cañon ¹ where more compact sandstones prevailed, causing us to make weary ascents of the steep mountain sides to continue our way. It was close upon sunset before we found ourselves at the head of the glen proper, where the Gadat divides and spreads itself over the scarred face of the main axis. We found shelter for the night in the house of a sheik at Zarktan.

¹ Pronounced *canyon*.

Resuming our march, we crossed a series of remarkable wall-like ridges, divided by profound gorges cut out of the red and grey shales which here form the mass of the mountains, and at length descended into the defile of the Asif Adrar-n-Iri—one of the chief feeders of the Gadat. By this portal we pushed our way into the very heart of the great range. At each step made we seemed to be getting deeper and deeper into a land of death and desolation. Not a tree or bush, or even a patch of green grass, was to be seen, except along the immediate banks of the stream. The mountain towered far overhead in precipitous slopes of grey and black shales, or overhung the glen in jagged, frowning precipices of rusty-coloured sandstones. The snow lay in masses on the higher peaks and striated the upper zone, but nothing else varied or softened down the desolate character of the scene. We might, without any stretch of imagination, have imagined ourselves in the heart of a recently extinct volcano, with the ash-heaps lying about as they fell, and the lava-streams as they were congealed. Yet even amidst all this sterility we found hard-working Berbers wresting a scanty living from the barren soil, and in one of their hamlets, named Titula, at the head of the glen, we camped for the night.

Next day we attacked the last heights which lay between us and the southern slopes of the Atlas. Immediately above Titula, a series of quartzite rocks bends round and runs at right angles to the line of the glen, and this it was which had resisted all the denuding forces of Nature, and stood as a barrier between the basin of the Gadat and the valley of Teluet on the other side. In a couple of hours' hard climbing we reached the top of the Tizi-n-Teluet, at an elevation of 8300 feet. On the east and west the mountains still rose from 4000 to 5000 feet in frowning masses above us, but that we thought little of, for we could not only command a view down through the gorge of the Gadat to the plain of Marocco and the peaks of Rahamna, but to the south our eyes swept over the valley of Teluet and the broken plateau region

beyond, through which the tributaries of the Wadi Draa cut their way.

JOSEPH THOMSON.—*Scottish Geographical Magazine*, April 1889.

By permission of the Royal Scottish Geographical Society.

Algeria

Algeria is the premier colony of France. It faces the mother country, though 500 miles distant, on the southern shores of the Mediterranean. On the west it has an unprogressive Mohammedan state, Marocco, for a neighbour; on the east, a prosperous French protectorate, Tunis; and in the south, a desert, which, more effectively than any other barrier to migration, sets a limit to European colonisation.

Physically Algeria is the ideal type of an African colony. From the ocean to the interior limits of its natural hinterland we find the typical gradation of fertile littoral, healthy and productive uplands, and desert.

The climate and vegetation of Algeria approximate to those of Southern Europe, but are more sub-tropical in character. The average rainfall of Algeria is sometimes taken at 29 inches. The highest rainfall, over 31 inches, is recorded in the Jujura Mountains, to the east of Algiers; the lowest, of course, in the desert. The intervening regions receive, roughly, from 23-31 inches on the northern slopes of the Atlas, and from 15-23 on the southern slopes. On the border of the desert there is an annual rainfall of from 7-15 inches. Algeria suffers very much from the absence of important rivers and the prolonged drought in summer, but extensive irrigation works have been undertaken to supply these defects, while in the south, especially at the base of the mountains, there are inexhaustible supplies of subterranean waters.

Coinciding with the systems of climate, we find well-marked and diversified characteristics of soil. Broadly speaking, there are three distinct regions: the Tell lands of the littoral, the High Plateau, and the Saharan or desert

tracts. The vine, cereals, olives, and oranges are cultivated in the Tell ; cereals and alfa are raised on the High Plateau ; and in the desert region date-palms and fruit trees bear fruits in summer, whilst in the winter flocks and herds occupy the attention of the inhabitants. The natives of Algeria devote themselves almost exclusively to cereals and cattle, and the European colonists to viticulture. Enough cereals are raised to feed the entire population and to leave over considerable quantities for export. Agriculture is as yet almost restricted to the Tell. The soil in parts of the High Plateau is, however, very fertile ; but the regulation of the water-supply and the restoration of the forests are essentially costly. In the Sahara, too, large fortunes may be made by cultivating the date palm.

A. SILVA WHITE.—*Scottish Geographical Magazine*, April 1894.

By permission of A. Silva White, Esq., and of the Royal Scottish Geographical Society.

Tripoli

Tripoli is perhaps less known than any part of North Africa,—I would venture to say even than Marocco. Of its two neighbours, Tunis and Egypt, Tripoli has much more in common with the latter. Tunis has the rugged hills, the fertile plains, and, as far as its northern half is concerned, the uncertain climate of Algiers and Marocco. Tripoli, on the other hand, is like Egypt, in the Libyan desert ; and also its climate is more like that of Egypt than of any other country. There is, however, one great difference between the two—a difference, moreover, of vast importance. Egypt is the child of the Nile, born of her, supported by her, and dependent on her. Tripoli is riverless ; so that, while in Egypt a vast population has lived and worked for untold ages, for thousands of miles along her river banks, in Tripoli the settled population has been confined to the coast, and to such large fertile tracts as happen to exist.

The whole province of Tripoli, shown upon our maps,



A STREET IN BISKRA, ALGERIA.

covers a very large area. There is, first of all, what may now be called Tripoli Proper, extending along the coast from Tunisia to the southernmost point of the Gulf of Sidra. West of this comes Barka, of much less area, but full of historic interest; while to the south of Tripoli itself lies Fezzan, a wild and inhospitable desert, intersected by wadis, and crossed by caravan tracks, which converge on Tripoli from various points of the Sudan.

W. S. COWPER.—*Scottish Geographical Magazine*, January 1896.

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The Sahara

Over one-half of the Sahara is occupied by plateaus and mountains, the remainder is steppe land and desert dotted with oases. The transition areas bordering on the cultivated zones are more extensive in the extreme south than in the north. Not more than one-ninth is covered by the endless sands which popular tradition formerly assigned to the whole area of the Sahara.

The highest elevations occupy the middle regions along the central axis of the Saharan plateau, running in a N.W.—S.E. direction and culminating in the mountains of Tibesti—an imposing nucleus with summits of nearly 8000 feet. Its extension in the plateau to the N.W. contains summits of over 5000 feet. This highland region, built up of limestone and sandstone, though falling under the mean elevation of the chief European ranges, rivals them both in length and extent—it is in fact about 1000 miles long. Between it and Tripoli another highland region occurs in the border range; and outlying groups of mountains, containing heights of 5000 feet, are found elsewhere within the Sahara, as in the Azben plateau. In the east the Sahara plateau adjoins the watershed of the Nile, in the south it meets that of the Congo, and in the west that of the Niger-Benue. The Ahaggar highlands drain by wadis into the Niger basin; but some of the

streams flow north, and others are lost in the inland basin of the desert. Enclosed areas of relative depression occur, more especially on the Western Sahara, and others are found near the borders of the highest mountains, as, for instance, that lying under the Borku plateau, the Bodele, which receives the overflow waters of Lake Chad by the Bahr-el-Ghazal channel.

The Sahara is furrowed in many directions by water-beds, none of which contain water the whole year round; but in the length and width of their channels they rival the great rivers of Europe, thus pointing to a time when, under more favourable climatic conditions, this region was traversed by magnificent waterways. The underground supply of water at the present day is, on the other hand, remarkably great. In most places, especially near high land, water can be reached by sinking for it. This subterranean water-supply, when brought to the surface by artesian wells, and when naturally flowing near the surface, or into areas of relative depression, creates, as if by magic, those refreshing oases on the caravan routes between the Mediterranean States and the Sudan, which serve as so many stepping-stones across the inhospitable wastes.

A. SILVA WHITE.—*Development of Africa*. George Philip and Son.
By permission of A. Silva White, Esq., and Messrs. Philip and Son.

Animals of the Sahara

The domestic animals of the Sahara are camels, sheep, goats, horses, donkeys, cattle, and gazelles: antelopes, wolves, hyænas, ostriches, foxes, jackals, wild boars, and leopards are the game. Here, as elsewhere, a harmony exists between the fauna and the soil. The camels, sheep, and reptiles have the yellowish hue of the sand. Again, the necessity of covering long distances in search of pasture has produced great length of limb: even the sheep have longer legs than those in this country. Perhaps the most distinctive feature is the ability to go a long time without water which all the animals possess—the camel in a

marked degree. He can travel six to ten days without water, feeding on the acacia and other thorny bushes, and at the end of this time can drink more than a hundred pints of water. The camel of the Sahara is the dromedary with one hump. To the natives this animal is indispensable: it carries them from place to place and supplies them with meat and milk. Many natives live upon camel's milk alone for nine months out of the twelve. A she-camel yields milk for ten months, supporting one person besides her own foal; thus, if a man owns, say, three she-camels, he can wander about at will, without the necessity of seeking food for his family. The ostrich also is peculiarly adapted for the desert; it feeds on the tops of certain shrubs, and can live a long time without drinking. The gazelle is valued for its flesh, and its skin is tanned and manufactured into various useful articles.

DR. F. S. ZAYTOUN.—*Scottish Geographical Magazine*, March 1897.

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In the Tunisian Sahara

To the south-west of Tatawin the mountains of the Sahara assume their typical form of a broken-down plateau. Sometimes it would seem as though this eroded plateau consisted of two different deposits, one on the top of the other. In each mountain one sees first of all a flat wall of stratified rock (surmounted, perhaps, by a loose soil); then follows a smooth slope or *talus* of rubble, which is interrupted half-way down the mountain-side by a second vertical wall of natural masonry—slabs of rock lie horizontally one on the top of the other, as though placed there by a race of giants. The rock which composes this natural wall is often of a fiery red, almost crimson, colour. At other times it is rust-red or even pink. The rubble which composes the vast slopes of this worn-down plateau consists of stones of a dirty yellowish-white or Naples yellow, in some parts calcareous. In some of these mountains the soil would appear to be full of lime. It

is much eaten away by wind and rain-water into fantastic forms and caves. All this part of the Sahara undoubtedly consists of a flat table-land cut up into blocks (which continue to dwindle and crumble) by the action of water, and still more, in recent times, by the strong sand-laden winds, which triturate and rub down the surface of the rocks. Man has long inhabited this inhospitable region. Although it appears at first sight the most hopeless desert, water is nearly always to be obtained by sinking wells in the dry watercourses, or hollows between the ridges of plateau, or even on the high plateau itself. And these table-mountains, with their steep sides, formed natural castles and strong places, where man has added masonry so exactly in the style of the geological formation around him, that at a distance it is impossible to tell the natural castles and walls from the artificial.

SIR H. H. JOHNSTON.—*Geographical Journal*, June 1898.

By permission of Sir H. H. Johnston and of the Royal Geographical Society.

Shotts or Shats of Southern Tunis

The *shats*, or salt lakes, of the south of Tunis are rather a disappointment to the traveller. On the map they promise so much in the way of expanse of water, and in reality all one sees is a flat plain of hardened mud, with a few streaks and pools of stagnant water and stretches of white salt incrustation. It is probable that these shats were at one time connected with the sea near Gabes. Some portion of their bottoms are said to be below the level of the Mediterranean, though not to the extent originally stated by those engineers who talked of letting the sea into the south of Algeria. Apart from the diminished rainfall, man has been the principal agent for the last few centuries in the drying up of these salt lakes by intercepting the water of the innumerable hot springs and spreading it out in such elaborate irrigation of the desert that very little of it reaches the lake shores.

The heavy showers which occasionally fall in the late autumn make these shats too muddy to be passed by man or beast ; otherwise in the dry season of the year they are traversed as one might traverse a slightly marshy plain.

Their appearance from a distance varies according to their degree and angle of sunlight. On a dull day the traveller looks down from the heights on a perfectly flat plain of mud-colour, and sees no shat ; on another occasion, when the sun strikes the salt incrustation and the thin sheets of rain-water the appearance is then something like a lake. Yet the view is rather grand from Tuzer or Nefta. One looks eastward over a perfectly flat surface, which gives one an extended horizon, level as the horizon of the sea. Far away to the right and to the left stretch the encircling mountain ranges, 40 miles apart. With the aid of an occasional mirage and the refraction from the salt, the effect is that of a vast expanse of water, a gulf which might communicate with the Mediterranean.

The country around these shats is of such desert aridity that the dense forests of date-palms which mark the sites of each oasis are enhanced in their effect of shade and verdure. All the Jerid is a most picturesque country from the artist's point of view. The bare mountains of fawn-coloured sandstone assume at sunrise and sunset the most lovely rose-tints I have ever seen. Some of the hills, which are calcareous and whitish, rival at these times the sunset glow on snow-fields.

SIR H. H. JOHNSTON.—*Geographical Journal*, June 1898.

By permission of Sir H. H. Johnston and of the Royal Geographical Society.

In the Algerian Sahara

After a long ride over a dismal plateau we reached a kind of gorge without any vegetation. After a little it turned sharp to the left, and suddenly there burst upon my view a most marvellous forest of palm trees ; emerald green grass sprang up everywhere, while on each side of

the way the crowns of the palms formed a complete canopy over our heads. Much refreshed at this sight we pushed forward and entered the mud-built city of Berrian, where the Kaid Jahia-ben-Afar presently came up and politely saluting me, after the fashion of the country, by kissing my hand, asked me to his house. Berrian is one of the six cities forming the semi-independent Mزاب confederation, situated on the rocky plateau from 1000 to nearly 3000 feet high called Chebka, on account of the number of ravines cut right and left into it. There are four principal valleys. There is no water here but from wells, except when they have occasional rains, but this is very rare. I was very hospitably received in Berrian; perhaps part of the warmth of my welcome may be attributed to the rain which began falling just as I rode into the town.

My camels were over-tired. I gave them a feed of barley and let them rest for the night, leaving next morning for Ghardaia. We rode along a howling wilderness, not a patch of green, not a pool of water to be seen, only iron-coloured plateaux stretching as far as the eye could reach, with here and there a streak of red-coloured rock, here and there a sharp summit, always conical, the evident result of primeval denudation, or some half-hidden ravine enclosed by abrupt crags. Late in the afternoon, after a long march, we came on the brink of a sharp declivity, where a valley suddenly opened, full of palm trees growing in the golden sand. Surrounded by these trees is Ghardaya; it rises like a huge sugar-loaf surmounted by a clumsy tower, with a smaller tower leaning, much resembling the famous one at Pisa. In the distance I could perceive the other cities.

I finished the tour of the Mزاب cities and then left for Wargla on 2nd January. The third day we began our march at three o'clock in the morning. At dusk we came on the limits of the rock plateau we had been following. The scenery changed at once. Queer sand-hills rose abruptly on all sides, the eye could not appreciate the distances or the declivities; sometimes the sand-hills formed in long ranges, like long Atlantic waves,

sometimes they were chopped up like an angry channel sea. The moon rose behind two hills looking like a pair of horns, and illuminated the scenery with an unearthly livid red glare. Even the silence among these strange hills had something supernatural. At last the dark streak of the oasis came in sight, and as we pressed on the sand assumed a silvery hue, and puffs of soft perfumed air reached us. After crossing some high sand-hills we entered amidst beautiful palms, and having given water to our poor horses, who had carried us eighteen hours, stopped at the door of the Kaid. The palm forest of Ngussa hides inexhaustible treasures for the artist. The town itself is curious, with its mud arcades, its filthy and half-negro population.

Next day, after two hours' ride among the sands, the long majestic line of the oasis burst upon my view. Here was Wargla at last. I liked the town with its tropical aspect and its negro population. It is all built of mud, so that when rain chances to come, it is always more or less in danger of melting. The oasis, with the surrounding villages, contains a million of palm trees. The palm tree is the only resource of the people of Wargla; they depend entirely upon it.

VALENTIN DE GORLOFF.—*Proceedings of the Royal Geographical Society*, June 1882.

By permission of the Royal Geographical Society.

The Oasis of Taflet

Taflet may be said to consist of a long strip of irrigated land extending along the parallel beds of the Wadi Ziz and the Wadi Gheris. To attempt to estimate the extent of ground under cultivation would be too hazardous to be of any value, for the oasis varies so much in width from place to place, according as the irrigating canals are taken far afield or not, that nothing short of a careful survey would give a satisfactory result. Again, it is impossible to state with accuracy the southern limits of the oasis, for much of the land situated north of the junction of

the Wadi Ziz and the Wadi Gheris is only capable of cultivation after exceedingly heavy rains. From the northern limit of the oasis of Tizimi to the junction of the rivers Ziz and Gheris may be safely estimated at from 40 to 50 miles, the average width of this portion of the oasis being about 10 miles. All this district of, say, 450 square miles is under dense palm cultivation.

It is seldom in the oasis of Tafilet that one's view extends to more than 100 yards or so in any direction. This is owing to the extraordinary thick growth of the date-palms, which rise on all sides a bewildering forest of straight stems. In Ifili, too, the high walls of the gardens obstruct one's vision in every direction. These walls are built of the native concrete, *tabin*, and are often so high that only the tops of the fruit-trees within appear above them. The water from the irrigating channels finds ingress into these gardens by subterranean conduits, while small bridges cross the roads, formed by palm-trunks laid from side to side and covered with sand. One comes quite suddenly upon the high-walled *ksor*, which, until one has approached them nearly, are entirely hidden by the gardens and palms. The outer portions of the oasis are less thickly grown over with palms, but the line between the desert sand and the alluvial soil and irrigated oasis is clearly defined. One walks out of a green field of palm trees ankle-deep into soft yellow sand, and one's vision stretches away over undulating white hills, the very glare of which is painful to the sight. Here and there throughout the oasis are large open spaces, usually for the purpose of drying dates in, and now and again for local markets or *soks*. The walled villages, too, often have a clear space surrounding them of 20 yards or so of open ground, to allow the sight of the attacking force in their continual intertribal wars. Nothing more bewildering can be imagined than the roads, or tracks, that thread the oasis. Owing to the great value of land, they are as narrow as practicable, and turn and twist in every direction amongst the gardens.

With regard to the products of Taflet, the most important without doubt are the dates, and it is from this culture that the inhabitants are enabled to exist at all. Not only are they sent by caravan all over Marocco, but there are merchants of Fez who ship large quantities to London, and we often eat here in the centre of civilisation dates that are grown in this far-away and little-known oasis, and which have been carried on mule- or donkey-back over the hot arid desert and the snowy passes of the Atlas Mountains. To realise the enormous quantity of dates grown at Taflet one must see the oasis. The palms, planted so thickly and so closely together as to obstruct one's vision in every direction, form a gigantic forest, to pass through which, by the narrow lanes, is bewildering. The commoner varieties are eaten in the country, or given as fodder to the cattle, goats, and horses. Besides the dates, crops of wheat and barley are grown at Taflet, especially in the land to the west of the Gheris. Millet and maize, however, are more common, and form the principal food of the people. In the gardens, cabbages, onions, peas, beans, grapes, pomegranates, apples, pears, gourds, and melons flourish, but are only cultivated by the richer classes, turnips being the favourite vegetable of the poor. Large quantities of lucerne are grown in the shade of the palm-trees, and stored away for winter fodder for the horses and cattle. The only export of manufactured goods from Taflet are the prepared skins, famous all over Marocco as *jeld el Fileil*, and fine haiks, the fleece of the native sheep being very fine.

W. B. HARRIS.—*Taflet*. W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

Berber Home Life

A stable-yard, a large enclosed space, divided the house from the street of the village, and, passing through

this, a walnut-wood door, of roughly sawn planks, gave entrance to the house. Within all was darkness, and it was only by striking a match that I could perceive we had entered a wide and dusty passage which seemed to lead nowhere. Groping along a gradual ascent, which took the place of stairs, we reached the first floor, on which most of the living apartments were situated, the remainder of the ground floor serving as stabling, and opening by another entrance into the yard we had already passed through. Still ascending, we entered at length a large unfurnished room some 30 feet square, the whole black with smoke. Here we found a number of women, mostly accompanied with babies in arms, attending to household affairs. Some were cooking the meal that was being prepared for our reception over fires of inferior and smoke-giving charcoal, while others were weaving on hand-loom a heavy woollen material, to serve eventually for the *haidus* or cloaks of the Berbers. The walls of the room were of rough *tabia* and the floors of plastered mud, while the ceiling consisted of trunks of walnut trees supported on pillars of *tabia*, and covered with brushwood and clay above, the latter forming the floor of the next storey. A few huge copper cooking-pots and a rough unstained box or two formed all the furniture visible, together with a heap of dishes of considerable size, each a segment of the trunk of large walnut trees skilfully hollowed out. Some of these were already filled with the steaming *kuskusu* and boiled turnips that were to form the staple *pièce de résistance* of the coming feast. Again an ascent of clay, supported on walnut beams fastened into the wall, led us to a second chamber of much the same dimensions as the first, only, in place of the narrow loopholes which allowed a dim light to enter in the lower storey, there were here round holes in the roof, serving at once for windows and chimneys, and decidedly unsuccessful as either, for the heavy smoke of fig-wood charcoal hung like a cloud in the air, obstructing what little light might otherwise have entered. In other respects the rooms were in every way

identically the same, the walls black with smoke and covered with cobwebs near the ceiling, but with these exceptions tolerably clean. Again we ascended, this time emerging on to the flat roof, in the centre of which stood a highly-decorated room built of mud bricks, with a door of the usual walnut wood and two or three small windows with shutters.

W. B. HARRIS.—*Tafilet*. W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

A Visit to the Tuareg

The encampment consisted of leather tents of larger or smaller size, but it evidently belonged to a chief without great power, as seemed to be apparent from the total absence of camels or horses.

However, I immediately conceived a favourable impression of the muscular strength and dexterity of these people; for when we approached the tent of the chief, who was sitting inside upon his couch of reeds, he with a single jerk jumped out and stood upright before us. Of course the tent was open in front, but nevertheless it appeared to me a great gymnastic feat, especially taking into account the lowness of the entrance, as in jumping out he had to stoop at the same time. Without delay a smaller tent was placed at our disposal, and we made ourselves comfortable.

The tents, *ehe* (pl. *chennan*), consist of a large round piece of leather formed of a great number of smaller sheepskins cut in quadrangular pieces and sewed together, while the borders of the whole are left purposely very irregular, in order to pass the stalks, which describe the outward circle of the tent through the projecting corners. These skins are spanned over three pairs of poles, the middle pair of considerable elevation, the remaining two not so high, and one of them, on the right of the entrance, being forked, although the middle poles are not always the same, in some tents both joining at the top, in others seeming to stand apart.

In such a tent there are generally two couches, or divans, made of a fine species of reed, and raised about a foot from the ground, for these people generally choose the most swampy places for their encampments, and after a thunderstorm are generally to be found in the midst of a lake. They are also not wanting in comforts; and on every couch there is a leather pillow, which certainly seems very essential, as it would be most uncomfortable to rest the elbow on the uneven and hard surfaces of these reed couches. Almost all the furniture of these simple people, besides a few wooden bowls for eating and drinking, consists of leather bags of excellent workmanship, and sometimes very tastefully ornamented. In these they stow away their clothes, as well as their provisions, and during the night they surround the whole tent with very neat mattings of a fine species of reed, so that a tent of this description forms quite a comfortable dwelling.

Although our host was evidently not one of the first-rate chiefs, he, as well as his kinsfolk and friends who came to visit us, had a very noble and prepossessing appearance, being rather broad-shouldered, stout, and well knit, with a pleasing expression of countenance and a fair skin, though there were a few among them who, with their coarse features and their dark skin, bore testimony to the deterioration of the Berber blood. We had scarcely made ourselves comfortable when we were treated with large quantities of fresh and sour milk, while a fat sheep was slaughtered and prepared for our supper, but without any additional food, these people living almost entirely on meat and milk.

H. BARTH.—*Travels in Timbuktu and the Sudan.* Ward, Lock, and Co., Ltd.

Nomadism of the Desert Dwellers

The Arabs are creatures of necessity; their nomadic life is compulsory, as the existence of their flocks and herds depends upon the pasturage. Thus with the change of

seasons they must change their localities, according to the presence of fodder for their cattle. Driven to and fro by the accidents of climate, the Arab has been compelled to become a wanderer; and precisely as the wild beasts of the country are driven from place to place either by the arrival of the fly, the lack of pasturage, or by the want of water, even so must the flocks of the Arab obey the law of necessity, in a country where the burning sun and total absence of rain for nine months of the year convert the green pastures into a sandy desert. The Arabs and their herds must follow the example of the wild beasts, and live as wild and wandering a life. In the absence of a fixed home, without a city, or even a village, that is permanent, there can be no change of custom. There is no stimulus to competition in the style of architecture that is to endure only for a few months; no municipal laws suggest deficiencies that originate improvements. The Arab cannot halt in one spot longer than the pasturage will support his flocks; therefore his necessity is food for his beasts. The object of his life being fodder, he must wander in search of the ever-changing supply. His wants must be few, as the constant changes of encampment necessitate the transport of all his household goods; thus he reduces to a minimum the domestic furniture and utensils. No desires for strange and fresh objects excite his mind to improvement, or alter his original habits; he must limit his impedimenta, not increase them. Thus with a few necessary articles he is contented. Mats for his tent, ropes manufactured with the hair of his goats and camels, pots for carrying fat. water-jars and earthenware pots or gourd-shells for containing milk, leather waterskins for the desert, and sheep-skin bags for his clothes—these are the requirements of the Arabs.

SIR S. BAKER.—*The Nile Tributaries of Abyssinia.* Macmillan.

By permission of Messrs. Macmillan and Co., Ltd.

II.—ABYSSINIA, THE NILE, AND EGYPT

The Nile

THE Nile, leaving the Victoria Lake, at a height of 3800 feet above the sea-level, falls rapidly to the Albert Lake, then runs more quickly to the Fola rapids, whence the river is navigable for a distance of nearly 1400 miles to Khartum, receiving on its way thither the waters of two other large rivers, the Bahr-el-Ghazal and the Sobat. A few miles to the north of Sobat junction is the town of Fashoda,¹ which, when I visited it some years ago, was a flourishing centre of population, with good plantations of cotton and sugar-cane. Corn was grown in considerable quantities, and the country gave good promise of future development.

At Khartum the Nile, which down to that point is known as the White Nile, is joined by another great river, the Blue Nile, that flows from the mountains of Abyssinia, and is navigable for hundreds of miles above the point of junction. From Khartum the river continues its course northwards, and 200 miles farther is joined by its last tributary, the Atbara, which brings down a great deal of water during two or three months of the year, but cannot be regarded as of much use for commercial purposes. From the mouth of the Atbara to the Mediterranean, a distance of 1650 miles, the Nile receives no other tributary, but flows through a country which, if it were not for the fertilising waters of the river, would be a desert. It is hardly necessary to point out what an important element in the

¹ Now called Kodok.

question of opening up the Sudan to commerce is contained in the fact that there are so many hundreds of miles of navigable river from Berber to the south, greatly facilitating the possibilities of commerce. But on the other hand, the Nile below Berber, and from that town to the frontier of Egypt, is unfit for navigation. There are, of course, stretches of open water here and there, but these are so divided from one another by cataracts and rapids that to use the Nile for navigation is practically impossible.

LIEUT.-COL. C. M. WATSON.—*Journal of the Manchester Geographical Society*, 1894.

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For a fuller account of the White Nile, see *Scottish Geographical Magazine*, February 1899, pp. 64, 65.

The Nile at Lake Victoria

The Nile, where it issues from the Victoria Lake, is a deep, broad stream from 500 to 800 yards across, with a strong current towards the Ripon Falls. The scenery is very beautiful, for the banks are high and densely wooded, and small islands dot the bay (Napoleon Gulf), or stand out to sea in the blue distance. Large schools of hippo snort and grunt in the water, and the old familiar cry of the kwazi (fish-eagle) recalls unforgotten scenes on the Nyasa Lake, while the vast expanse of water to the far horizon reminds us of the ocean.

SIR F. J. D. LUGARD.—*Our East African Empire*. W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

The Egyptian Sudan

The Sudan, which includes the whole of that portion of Central Africa lying between the 10th and 20th parallels of latitude, is the name popularly employed to

designate the southern portion of the Egyptian kingdom ;¹ but it would be more correct to use the general terms—"The Egyptian Provinces of the Sudan," "Equatorial Provinces," and "The Red Sea Provinces." On the east of the Nile the desert extends to the Red Sea, where Suakin is the only practicable port, and on the west we find a continuation of the Libyan wilderness that flanks Egypt Proper and embraces Kordofan and Darfur. Granite and sandstone-hills line the main valley for the most part, so that, up to Wadi-Halfa, cultivation is confined to the mere banks of the river. At Wadi-Halfa the second cataract begins, and extends for 100 miles in a series of rapids through the Dar-el-Hajar to Sukkut, where the valley widens and sterility disappears. Fertile plains stretch out on both sides, and the river is studded by well-cultivated islands. Here the Nile seldom overflows, and artificial irrigation is necessary. Cultivation continues up to the third cataract, but contracts again on passing the island of Arko. Dongola, the peninsula formed by the great bend of the Nile, is a fine savana, peopled by several tribes, who rear goats, camels, and large flocks of sheep, and cultivate considerable tracts of land. In the course of this bend the country of the Berbers is passed, to the south-east of which lies the province of Taka (now Kassala), one of the most productive portions of Egyptian territory.

At Khartum, the capital of the Sudan, the Blue and White Niles (Bahr-el-Azrek and Bahr-el-Abiad) mix their waters, the former flowing from the Abyssinian hills, the latter from the Equatorial lakes. Here the frontier of Sennar begins. This province may be generally described as bounded east and south-east by the Atbara and Abyssinia, west by the White Nile, which separates it from Kordofan, and south by the mountains of Fazokl. It is for the most part an undulating plain, increasing in elevation southwards, and, especially near the rivers, abounding in

¹ Now Anglo-Egyptian. The economic notes serve to indicate the possibilities of the region under progressive governors.

forests. The soil near Khartum is sandy and mixed with Nile mud; but farther south a deep bed of argillaceous marl succeeds, which, though apparently sterile in the dry season, is covered with crops during the autumnal rains. Due west lies Kordofan, and, separated from it by a narrow strip of desert, Darfur. This province is in reality a huge oasis, or cluster of oases. Towards the south it is hilly. Wedged in between Kordofan and Sennar is the Shilluk country, a slip of territory some 200 miles long, by scarcely a dozen broad, the soil of which is fertile. To the west and south of this lie the Darferit and Donga countries, included in the Bahr-el-Ghazal, and to the south and east of the latter are the Equatorial provinces, which are bounded to the south by Lake Albert Nyanza and the Victoria Nile (now part of the Uganda Protectorate).

ANON.—*Scottish Geographical Magazine*, April 1885.

By permission of the Royal Scottish Geographical Society.

The Sennar Dam

When plans for the development of the Anglo-Egyptian Sudan were considered, attention was soon focused on the Gezira Plain on account of its unique situation, and the obvious advantages it had from the standpoint of irrigation. Whereas the country below Khartoum has only one stream, the land above forms a triangle, with Khartoum at the angle of two rivers of nearly equal magnitude, the White Nile which flows leisurely out of the equatorial swamps, and the Blue Nile, a more turbulent stream, coming down from the mountains of Abyssinia.

Between the two streams lies the plain of Gezira, comprising an area of over 7000 square miles, most of which is slightly above the normal flood level of the Blue Nile. On the White Nile villages are scarce, mainly because the comparatively low-lying land is covered with a vast area of papyrus and other aquatic plants, which grow at an amazing pace, and not only continually choke

the waterway, but cause it to spread out into an immense swamp. This region is, therefore, not arable, and the presence of mosquitoes renders it extremely unhealthy.

On the Blue Nile villages are frequent, and the largest of them, Medani, contains a population of about 10,000. Owing to the nature of the country in which it rises and through which it flows, the Blue Nile varies tremendously in volume. Between December and June it is useless for irrigation or navigation above Sennar, but in flood time it can be navigated up to Rasières, near the Abyssinian border. Not only is the volume of water of great magnitude, but it is heavily charged with nitrogenous matter washed out of the hills. . . .

It was proved beyond question that given suitable irrigation, cotton could be grown on Gezira, which was equal to the best sea island product. The increasing demand for cotton strengthened the support given to the scheme (for the erection of a barrage at Sennar), and by 1914, ten years after the original proposal was made by Garstin, the plans had been made, the survey completed, and the work of construction begun. Sennar was chosen because of the comparative narrowness and depth of the river, the rocky banks which provided a solid foundation, and the presence of an island which reduced the amount of material required.

The sudden onset of the War stopped the work, for neither material nor labour could be procured, but in 1919 a fresh start was made. . . . Fresh efforts were put forth in 1922, and at last a contract was made to complete the mould in three years. . . .

Twenty thousand men have been employed on the construction, which has cost over $5\frac{1}{2}$ millions, while the initial canal system, which will irrigate the first 100,000 acres on the east side of the plain, has cost another three millions. The dam is 2 miles in length.

HERBERT MACE.—An article in the "Sudan" number of the *African World*.

By permission of the proprietors of the *African World*.

Bahr-el-Ghazal

The whole of the Bahr-el-Ghazal district is splendidly watered. Numberless rivers rising in the south pour an immense volume of water into the Bahr-el-Ghazal, and between the streams forests of mighty trees or fertile undulating plains abound. Here tropical luxuriance is seen to perfection; the winding forest paths lead through charming sylvan scenery. One is completely surrounded by trees, whose mighty branches interlace so thickly that it is impossible to see their crown, which in many instances tower to a height of more than 100 feet. The dense foliage completely shuts out the sun, and even at midday one marches along in a dim mysterious twilight.

DR. R. W. FELKIN.—*Scottish Geographical Magazine*, June 1885.

By permission of Dr. Felkin and the Royal Scottish Geographical Society.

The Shilluks

The Shilluk tribe inhabits the entire left bank of the White Nile, occupying a territory about 200 miles long and about 10 miles wide, and which extends right to the mouth of the Ghazal River. The Shilluk land, which lies upon the White Nile, has an extent of hardly less than 2000 square miles, and, when the number of heads upon this is compared with those in the populous districts of Europe, we are justified in reckoning from 610 to 625 to a square mile. No known part of Africa, scarcely even the narrow valley of the Nile in Egypt, has a density of population so great; but a similar condition of circumstances, so favourable to the support of a teeming population, is perhaps without parallel in the world. Everything which contributes to the exuberance of life here finds a concentrated field—agriculture, pasturage, fishing, and the chase. Agriculture is rendered easy by the natural fertility of the soil, by the recurrence of the rainy seasons, by irrigation effected by

the rising of the river, assisted by numerous canals, and by an atmosphere ordinarily so overclouded as to moderate the radiance of the sun, and to retain throughout the year perpetual moisture. Of fishing there is plenty. There are crocodiles and hippopotamuses in abundance. Across the river there is a free and open chase over wildernesses which would advantageously be built upon, but for the hostility of the neighbouring Dinka. The pasture lands are on the same side of the river as the dwellings; they are just beyond the limits of the cultivated plots; occasionally they are subject to winter drought, and at times liable to incursions from the Bagara; but altogether they are invaluable as supplying daily resorts for the cattle. The entire west bank of the Nile, as far as the confines of the district reach, assumes the appearance of one single village, of which the sections are separated by intervals varying from 500 to 1000 paces. These clusters of huts are built with surprising regularity, and are so closely crowded together that they cannot fail to suggest the comparison with a thick mass of fungus or mushrooms. The domestic animals which the Shilluks breed are oxen, sheep, and goats; besides these, they keep poultry and dogs; other animals are scarce, and probably could not endure the climate.

DR. G. SCHWEINFURTH.—*The Heart of Africa.* Low.

By permission of Messrs. Sampson Low and Co.

The Feeders of the White Nile

The Bahr-el-Ghazal is the most important of the tributaries, not because of the volume it contributes, but because of the large area it drains with its numerous tributaries. Its depth is 30 feet below the mouth of the Bahr-el-Arab, and only 15 feet above. Where it is joined by this affluent it expands to a width of 1000 feet. The Bahr-el-Arab rises in Southern Darfur, and has a course of 400 miles.

The sluggish current of the Bahr-el-Jebel,¹ Bahr-el-Zeraf,² Bahr-el-Ghazal, and the lower course of the affluents, the marshes and numerous creeks, favour the formation of *sudd*. In the lagoons and backwaters aquatic plants grow with great luxuriance, which are detached from the soil during floods and carried into the rivers, where the sluggishness of the current allows them to collect into dense masses. So compact are these floating islands that the Nuers sometimes take up their abode upon them, supporting themselves with fishing, and hippopotamus and crocodiles getting entangled among them die of starvation.

The Sobat, which enters the Nile 505 miles south of Khartum, flows during the last 60 miles through flat and marshy country with a little timber and abundance of tall grass.

The Bahr-el-Ghazal joins the Nile at the Lake No, or Mogren-el-Bohur. The lake varies in area, being in summer about 60 square miles. As a rule the Bahr-el-Ghazal has a feeble discharge, and the channel is encumbered with vegetation, so that the traveller passing its mouth is apt to under-estimate its importance. When in flood it occasionally has a larger volume than the Nile. The Sobat also has a discharge in summer nearly equal to that of the Nile, but in winter becomes insignificant and sometimes even quite dry.

The Nile is high at Khartum for about a month from the end of August or beginning of September. The Blue Nile is at its height about 25th August, when it discharges about 8000 tons of water per second, which is about that of the White Nile. From November to March the latter is the chief source of supply. The average difference between high and low water is about 22 feet.

ANON.—*Scottish Geographical Magazine*, February 1899.

By permission of the Royal Scottish Geographical Society.

¹ Name of the Nile above Lake No.

² A loop of the White Nile.

The Nile Sudd

The hindrances to our progress caused by the excessive vegetation began now to give us some anxiety. All day long we were bewildered not only by the multiplicity of channels, but by masses of grass, papyrus, and ambatch, which covered the whole stream like a carpet, and even when they opened gave merely the semblance of being passages. It is quite possible that the diversion of its course to the east, which, for sixty miles, the Nile here takes, may check the progress of the stream, and be in a measure the cause of such a strange accumulation of water-plants. Here is a real web of tough tangle, which blockades the entire surface. Every here and there, indeed, the force of the water may open a kind of rift, but not corresponding at all with the deeper and truer channel of the stream. Such a rift is not available for the passage of boats. The strain of the tension, which goes on without intermission, has such an effect in altering the position of the weedy mass, that even the most experienced pilot is at a loss how to steer, consequently every voyage in winter is along a new course, and through a fresh labyrinth of tangle. But in July, when the floods are at their highest, navigation can be carried along well-nigh all the channels, since the currents are not strong, and the vessels are able to proceed without detention to their destinations. Thick masses of little weeds float about the surface of the water, and, by forming a soft pulp, contribute an effectual aid to bind together the masses of vegetation. Like a cement this conglomerate of weeds fills up all the clefts and chasms between the grass and ambatch islands, which are formed in the backwater where the position is sheltered from the winds and free from the influence of the current.

On the 8th of February began our actual conflict with this world of weeds. The entire day was spent in trying to force our boats along the temporary openings. The pilots were soon absolutely at a loss to determine by which

channel they ought to proceed. On this account, two vessels were detached from the flotilla to investigate the possibility of making a passage in a more northerly direction. Two hundred of our people, sailors and soldiers, were obliged to lug with ropes for hours together to pull through one boat after another, while they walked along the edge of the floating mass, which would bear a whole herd of oxen, as I subsequently had an opportunity of seeing. Very singular was the spectacle of the vessels, as though they had grown in the place where they were, in the midst of this jungle of papyrus, fifteen feet high.

Four days were consumed in this strain and struggle; after a final and unavailing effort on the fifth day, there seemed no alternative but to go back and make a trial of another and more northerly branch of this bewildering canal system.

DR. G. SCHWEINFURTH.—*The Heart of Africa.* Low.

By permission of Messrs. Sampson Low and Co.

On the Abyssinian Plateau

We arrived at Addis Abbeba on 19th January, and found the king was still on campaign. He had advanced his army to Dessieh, within 20 miles or so of Magdala, and we were obliged to make up our minds to this extra journey. The journey lay over the lofty plateau of basalt which stretches from the Danakil plains to the Blue Nile. Where the soil is sufficiently thin this shows through the surface in the form of a polygonal pavement, the exposure of the upper superficies of the columnar structure. The characteristic form appears in marvellous perfection where the mass opens out into precipitous chasms 4000 feet deep, forming perpendicular walls of the typical polygonal columns, of which perfect examples are seen at Staffa and the Giants' Causeway. The country is almost denuded of trees, except some stunted mimosas, in the more sheltered parts kosso, the tree whose seeds supply medicine, and in

the rocky beds the quolquol, acacia, and aloe. On account of its great altitude, 8000–9000 feet high, the products of the warmer zone are rare. Wheat and barley are grown in large tracts, but cattle and sheep are the main wealth of the population.

At Dar Nebba we enter the country of the Wollo Gallas, and approach one of those colossal ravines formed by the apparent opening of the horizontal layer of basalt in the secular upheaval of the land. The effect of travelling over a dead level plain, and suddenly coming to the sharp edge of a precipice, like a huge crack in the earth's crust, is very striking, and the difficulty of the roads leading in and out of such chasms may be easily imagined.

The road leads across the two almost parallel ravines of Adabai and Wunchit rivers, affluents of the Blue Nile, or Abai, as it is called in Abyssinia, the central rocky partition between the two rivers being about 6000 feet high, and the edge of the plateau on each side being about 8500 feet. The beds of the rivers are about 4500 feet above the level of the sea, making sheer depth of chasms 4000 feet. The last ascent has well been called Haya Fej (death to the donkey).

After Worro Hailo, an important strategical position, the country becomes mountainous, and we pass over the shoulder of Mount Yoel, at a height of 10,400 feet, into a series of fine rich valleys walled in by wooded hills and lofty peaks. Commanding one of these well-watered valleys, on a hill 2000 feet above them, was perched King Menelik's camp and residence, and round it in a succession of vast amphitheatre of hills were grouped the tents of his army.

To vary the monotony of a return journey to Addis Abbeba by the same route, we determined to descend from the plateau and go back by the lower road through a series of valleys, into which the lofty tableland breaks up in Titanic steps, to the lower level of the Danakil plain. The first two days' marches took us out of the dense clouds that had hung over the whole camp for several days, and

we found ourselves on the river Burkenna, an affluent of the Hawash, nearly 3000 feet lower, among a totally different vegetation and climate. Cotton grows luxuriantly, and the people also largely cultivate millet. Groves of limes are to be seen in abundance. The trees are olives, cypress, podocarpus, and the great *Euphorbia abyssinica*, the giant cactus, with its long green arms curved up like huge candelabra. On 23rd February we left the lower country, after crossing the Robi, an affluent of the Hawash, and again ascended to the higher plateau, which for seven days had been towering over us like a black wall. We reached a fine level grassy plain, the district of Diff-Diff, our first camp being no less than 9500 feet above the sea. We left Ankobar, the former capital, 20 miles on our left, a dwindled town of 4000 to 5000 inhabitants, largely priests. We arrived at the capital on 28th February.

H. WELD BLUNDELL.—*Geographical Journal*, February 1900.

By permission of H. Weld Blundell, Esq., and the Royal Geographical Society.

For a fuller account of the geography of Abyssinia, see WYLDE, *Modern Abyssinia*, ch. iv. Methuen.

The Abyssinians

The Gallas of their own country, the negroes of the Nile Basin, the Sudanese and Arab tribes, have all contributed without doubt towards the development of the present-day Abyssinian. Hence one meets with individuals resembling the Galla, the Arab, and the negro.

They are a muscular, brutal, energetic, though scarcely brave race. They almost confine themselves to their military occupation, for what agriculture, manufacture, and trade there are in the country are mainly carried on and produced by Gallas and foreigners, Indians, Greeks, Jews, etc.

The Abyssinian is pretentious and domineering to his inferiors, yet cringing and obsequious to his superiors.

His business being that of a soldier, he is more or less, though at times energetic, a lazy individual; he, though not a trader, is willing to take service as mule-driver and caravan-help, but will always shorten his day's work as much as he can. His inseparable companions are his rifle, cartridge-belt, and sword. The first is often of a most antiquated pattern, which, even when mule-driving and performing long marches, remains with him, carried over his shoulder. His sword is strapped tightly to his waist, and is a characteristic one, being very short, very much curved (scimitar-like), but narrowing to a sharp point; it is worn on the right side, and thus, when mounting a mule or horse, he always does so on the right or off side. Besides these weapons, he uses in warfare a large, round, basin-shaped, embossed leather shield, often ornamented with silver work. He boasts of being a Christian, but the Christianity he professes is only in evidence in the keeping of feast and fast, though a few, very few comparatively, attend church on early Sunday mornings, in response to the call of a doleful, cracked-pot-sound tolling bell; and a few also wear rosaries, though I never saw one being used.

The Abyssinian lives a more or less settled form of life, for he builds a house, though even in a so-called town, such as Addis Abbeba, he pays no rent. This house is of a very primitive type, at least in those parts we visited. It is a circular one; the walls are formed of mud-plastered sticks, while the roof is of grass thatch supported on roughly interlaced branches of trees and sticks. The interior is partitioned off by an inner circular wall; between this inner and outer wall, the rough spare household utensils are kept, as well as a cow or two, mule, or pony. The inner portion, with mud floor, slightly raised, is where the family lives; bed-places, again slightly raised and formed of mud, are round it; upon these the inmates squat when at home. The fire is laid on the ground, and the kettle or pan is either suspended from above, or more frequently supported upon three or four stones arranged

round the few burning sticks which constitute the fire. No aperture, other than the door, is ever made for the entrance of light or the egress of smoke; a more comfortable home it would be difficult to conceive. His churches are of the same kind as his house. They are circular, roughly made, but larger erections, and are surmounted by a cross, a characteristic Abyssinian one; it is composed of two iron crosses arranged stelliform, with a circular band joining and supporting each arm, the extremity of each being globular, and the whole is painted white. Except for this, and that it is larger, as well as for a number of gaudy, European-made chromo-lithographs of the Virgin, Christ, and the Saints, with, more rarely, some crude native drawings, attached to the inner circular wall, there would scarcely be anything to proclaim the sacred purpose for which the building is used.

The Abyssinian priest is distinguished by wearing a peculiarly-formed, white, turban-like cap, and carries a fly-switch made of horsehair; otherwise his dress is the same as that of the other males. This dress consists of a pair of white cotton pantaloons; a long white cotton cloth, which he folds about him, called a shammah, often broadly striped red in its length, or having an embroidered border; and in the early morning, or when it is cold, over this a dark brown, long pelisse-like woollen garment, called a bornouse. It is joined in front, and has an ample aperture at the neck; the whole is thrown over the head when put on. Not unfrequently a priest will also carry a wicker-work or grass-made umbrella or sunshade, of course uncollapsible.

The women wear a cotton skirt, and a loose cotton bodice, as well as also use the shammah. All walk barefoot, and, when riding, use the big toe only in the stirrup, which is made just wide enough for its reception.

The Abyssinian is very fond of display and of assuming importance. A man who is well-to-do, a chief, or an important personage, never goes out walking; he always rides his mule, and has as large an attendant retinue as

possible, who generally walk; these always, if possible, carry rifles.

DR. R. KOETTLITZ.—*Geographical Journal*, March 1900.

By permission of the Royal Geographical Society.

The Abyssinian Affluents of the Nile

The Blue Nile, or Bahr-el-Azrek, flows through Lake Tana, in Abyssinia, 5800 feet above sea-level, with an area of 1160 square miles, and has a course of 846 miles. The country in the upper stretches of the river, and along its tributaries, the Rahat and Dinder, is well wooded, but near its mouth it becomes bare, sandy, and uninteresting. A proper system of irrigation would render Dar-Sennar, the country between the Blue and White Niles, exceedingly productive. Hitherto only the lands along the streams, which are flooded in the rainy season, have been brought under cultivation.

North of the Blue Nile to the Atbara extends the island of Meroe. It is in general level, and towards the south-west is fertile grazing ground, but becomes dry and stony towards the north. To the west, beyond the Atbara, stands Kassala. The Khor-el-Gash, on which it stands, floods the plain during July and August, leaving a deposit of fertile alluvium, and water can always be obtained in the dry season by digging. The town, 1700 feet above sea-level, is dominated by a huge granite mass rising to a height of 3300 feet. To the north, the Khor Baraka, lined with vegetation, especially tamarisk, forms a green strip between sandy and stony country and mountains of bare granite and schist, which sometimes rise to 6000 feet above sea-level.

Between the Khor-el-Gash and the Atbara stretches a vast savana, with patches of mimosa, which is scorched up in the dry season. The Atbara receives the Gash at Adamara, and enters the Nile at Ed Damer, above Berber. Though the river has a length of 550 miles, it has the

character of a mountain torrent. Dry in the spring, except a few pools where the vegetation on the banks protects the water from evaporation, its bed, 16 to 20 feet deep and 500 yards broad near the mouth, is suddenly filled as soon as rain falls in Abyssinia, and the adjoining country is inundated to a distance of two miles. Then the inhabitants retire into the desert, returning to plant their crops, when the water falls, in the rich mud it leaves behind, and which it brings down in larger quantities than any other Nile tributary.

ANON.—*Scottish Geographical Magazine*, February 1899.

By permission of the Royal Scottish Geographical Society.

The Blue and White Niles

The two rivers which unite at Khartum to form the main stream of the Nile are absolutely unlike in character. The waters of the Blue Nile descend rapidly from the Abyssinian plateau, in a deep and narrow channel, carrying with them an abundance of fertilising matter gathered from the mountains and forests which form its watershed. Sometimes it flows in a shallow stream, at other times its banks can scarcely contain the volume of water which it pours impetuously between them. The White Nile, on the other hand, flows with a broad and sluggish stream between low banks, and the volume of its waters varies but slightly, since it is fed by the constant supplies afforded by the Great Lakes of Central Africa. The country which surrounds the Blue Nile and its affluents affords the richest prospects in the Sudan. The region through which the White Nile passes is a succession of desolate and fever-stricken swamps, behind which low and treeless plains flow in endless monotony.

BASIL WORSFOLD.—*Redemption of Egypt*. G. Allen.

By permission of Mr. George Allen.

Khartum

The town, which owes its existence to Lord Kitchener, is built about the old city of the Mahdi. It is laid out symmetrically. The straight sun-baked streets cross each other at right angles, and the whole city has a neat, formal appearance. The embankment along the river's edge, with its borders of acacias and gum-trees, makes the most agreeable walk in the city. In the evening a military band often plays there, and near by are the finest private houses, and such buildings as the Sudan Club, the Gordon Memorial College, and the Military Hospital. On the very site of the residence of the Mahdi, destroyed in 1885, stands the present Governor's palace surrounded by lawns and gardens bright with poinsettia, oleander, and bourgainvillæa.

At the western end of Khartum is a Zoological Garden, from which a commanding view of Omdurman, with hills in the background, can be obtained across the Nile, on whose sandbanks Egyptian vultures can be seen sitting in rows, and over whose waters swallows and martins flit during the winter months. Lying well back from the river is the non-Europe, our business quarter, where Greek, Syrian, and Coptic traders crowd in the busy bazaars. Beyond that again there is a Sudanese village which contains various distinctive tribes, each in its own settlement.

The P. and O. Pocket Book.—Fourth Edition. A. and C. Black, Ltd. 5s.

By permission of the P. and O. Company.

The Cataracts of the Nile

Between Khartum and Aswan, a distance of 1124 miles, there are 351 miles of broken water and rapids (commonly called the Cataracts), with an aggregate fall of 656 feet, and 773 miles of free channel, with a total drop of 312 feet.

The Sixth Cataract begins 52 miles below Khartum and ends 147 miles from the Atbara junction. Its length is not much over one mile, and the drop in the river is about

20 feet. Berber is 15 miles down-stream of the Atbara confluence.

The Fifth Cataract begins 28 miles north of Berber. It is 100 miles in length and has three principal rapids. The fall in the river-bed is over 200 feet. Abu Hamed is situated at the foot of this cataract.

The Fourth Cataract is between Abu Hamed and Dongola. It has a drop of 160 feet over a course of 68 miles.

Between the Fourth and Third Cataracts is the town of Dongola.

The Third Cataract is 45 miles long and falls 36 feet. It has two rapids.

The Second Cataract is 73 miles farther down-stream, and at its foot lies the town of Wadi Halfa. This, the famous Batn-el-Haggar, or "belly of rocks," is 124 miles in length and falls 216 feet. It has four rapids.

The First Cataract is 214 miles from the Second. It has a drop of 16 feet in 3 miles. The mean width of the river is over 500 yards, and the mean depths are 30 feet in flood and $6\frac{1}{2}$ feet in summer. Aswan lies at its foot.

A. SILVA WHITE.—*Expansion of Egypt*. Methuen.

By permission of A. Silva White, Esq., and Messrs. Methuen and Co.

The Atbara

The Atbara had a curious appearance; in no part was it less than 400 yards in width, while in many places this breadth was much exceeded. The banks were from 25 to 30 feet deep; these had evidently been overflowed during floods, but at the present time the river was dead; not only partially dry, but so glaring was the sandy bed, that the reflection of the sun was almost unbearable. The only shade was afforded by the evergreen dome-palms. Wherever a pool of water in some deep bend of the river's dried river-bed offered an attraction, were Arab villages or camps, of the usual mat tents formed of the dome-palm leaves.



SCENERY ROUND PHILAE.

Many pools were of considerable size and of great depth. In flood-time a tremendous torrent sweeps down the course of the Atbara, and the sudden bends of the river are hollowed out by the force of the stream to a depth of 20 or 30 feet below the level of the bed. Accordingly these holes become reservoirs of water when the river is otherwise exhausted. In such asylums all the usual inhabitants of this large river are crowded together in a comparatively narrow space. Although these pools vary in size, from only a few hundred yards to a mile in length, they are positively full of life: huge fish, crocodiles of immense size, turtles, and occasionally hippopotami, consort together in close and unwished-for proximity. The animals of the desert—gazelles, hyænas, and wild asses—are compelled to resort to these crowded drinking-places, occupied by the flocks of the Arabs equally with the timid beasts of the chase.

The cool night arrived, and about half-past eight I was lying half-asleep on my bed by the margin of the river, when I fancied that I heard a rumbling like distant thunder. A low uninterrupted roll appeared to increase in volume though far distant. Hardly had I raised my head to listen more attentively when a confusion of voices arose from the Arabs' camp, with a sound of many feet, and in a few minutes they rushed into my camp shouting to my men in the darkness, "El Bahr. El Bahr" (The river. The river).

On the morning of the 24th June I stood on the banks of the noble Atbara River, at the break of day. The wonder of the desert—yesterday there was a barren sheet of glaring sand, with a fringe of withered bush and trees upon its borders, that cut the yellow expanse of desert. For days we had journeyed along the exhausted bed; all Nature, even in Nature's poverty, was most poor: no bush could boast a leaf; no tree could throw a shade; crisp gums crackled upon the stems of the mimosa, the sap dried upon the burst bark, sprung with the withering heat of the simoom. In one night there was a mysterious

change—wonders of the mighty Nile—an army of water was hastening to the wasted river ; there was no drop of rain, no thunder-cloud on the horizon to give hope, all had been dry and sultry ; dust and desolation yesterday, to-day a magnificent stream, some 500 yards in width, flowed through the dreary desert.

SIR S. BAKER.—*The Nile Tributaries of Abyssinia.* Macmillan.

By permission of Messrs. Macmillan and Co. Ltd.

The Seasons in Egypt

Egypt being the gift of the Nile, the year is properly divisible into three well-marked seasons, corresponding with the phases of the river—summer, flood, and winter. The summer season extends from 1st April to the end of July. Water is then a most valuable commodity, the river being at its lowest. During this season, the most critical period, when the supply is inadequate, is the sixty days between the middle of May and the middle of July. The ensuing flood season begins on the 1st July and lasts till the end of November, when the river overflows its banks. The third or winter season embraces the months of December, January, February, and March. During this period the Nile is confined within its banks, and carries a supply of water in excess of the actual requirements of agriculture.

A. SILVA WHITE.—*Expansion of Egypt.* Methuen.

By permission of A. Silva White, Esq., and Messrs. Methuen.

For a fine description of the rise and fall of the Nile, see LORD MILNER, *England in Egypt.* Arnold. pp. 221-227.

Irrigation in Lower Egypt

Although there is no beauty of scenery along the line to charm the eye and take it captive, there is much that is novel and strange. You pass through a flat country, level as a lake ; but the valley is green with the young corn ; you see many a mud village, and many a small town with

its mosque and minarets ; strings of camels pass by with their long necks, and high heads, and patient looks ; donkeys and carts laden with straw and Indian corn come and go ; brown bare-legged men are busy amongst the millet or wheat ; and veiled women and naked children are either busy in the fields or idly basking in the sun. You see for the first time the *sakiye*, which is a water-mill of cogged wheels turned by an ox, and which, at each turn of the wheel, works up a series of earthen pitchers, which empty themselves into a trough, and through it send the life-giving waters through the thirsty land. Or perhaps it may be the *shaduf* that is at work. This consists of a long pole, very heavy at one end, and resting on a pivot. At the other end is placed a bucket, which is let down into the water and filled, and as the heavy end descends, the bucket pours its contents into a small trough.

From this it is worked by the foot, and flows into the channels, by which it is conveyed to the waiting fields. There is even a simpler method of raising the water intended for irrigation. Two men stand in the pool or stream, holding a bucket which is water-tight between them, and which, as they swing it to and fro, throws the water on to the bank, on which stands a third man, ready to turn it into the proper channel.

CANON BELL—*A Winter on the Nile*. Hodder and Stoughton.

By permission of Messrs. Hodder and Stoughton.

Permanence of Egypt

There is a permanence in the unchangeable features of the Nile regions. There are the vast pyramids that have defied time ; the river upon which Moses was cradled in his infancy ; the same sandy deserts through which he led his people ; and the watering-places where their flocks were led to drink. The wild and wandering tribes of Arabs, who thousands of years ago dug out the wells in the wilderness, are represented by their descendants unchanged, who now draw water from the deep wells of their

forefathers with the skins that have never altered their fashion. The Arabs, gathering with their goats and sheep around the wells of to-day, recall the recollection of that distant time when "Jacob went on his journey, and came into the land of the people of the east. And he looked, and behold a well in a field; and, lo, there were three flocks of sheep lying by it; for out of that well they watered the flocks: and a great stone was upon the well's mouth. And thither were all the flocks gathered: and they rolled the stone from the well's mouth, and watered the sheep, and put the stone again upon the well's mouth in his place." The picture of that scene would be an illustration of Arab daily life in the Nubian deserts, where the present is the mirror of the past.

SIR S. BAKER.—*Nile Tributaries of Abyssinia*. Macmillan.

By permission of Messrs. Macmillan and Co. Ltd.

Modern Egypt

To-day from Aswan, where the Nile waters break over the shallows and rocks of the first cataract, to Alexandria and Port Said, the iron road has been laid, and the tireless locomotive bears its freight of men and material. So the traveller who visits Egypt for the first time, traversing its length from the golden shores of the Mediterranean to the borders of Nubia, is surprised to find tall chimneys breaking the level of the landscape wherever he goes. In town and country alike the West jostles the East. In the midst of the streets filled with a mêlée of camels, donkeys, and loosely-clad Arabs, he is startled by a section of police, marching in single file, with their sergeant at their head. The faces of these uniformed figures are dark, but their bearing unmistakably recalls the model of London. So, too, in this country the landscape is oriental, but the tall white-brick shafts which rise above the line of palm trees are unmistakably western. The countenance of the desert is scored by the lines of the parallel way, and Father Nile,

the parent of Egypt, wears Western trappings in the iron bridges, with their rigorous lines, which span his waters.

BASIL WORSFOLD.—*Redemption of Egypt.* G. Allen.

By permission of Mr. George Allen.

View from the Citadel at Cairo

Every one who goes to Cairo visits the Citadel to see the sunset—visits it more than once; for the splendid prospect cannot be seen too often. The great city lies below you with its domes and cupolas and minarets, with its gardens and its palms and its moving throng of people; here a procession of donkeys with their riders, there a string of camels with their burdens. The Nile, winding its way through yellow sands, gleams blue in the distance, and touches in its course many a green spot which owes its beauty and fertility to its waters. Far to the west, across the opulent river, and on the edge of the arid desert, the Pyramids of Ghizeh and Dashmoor rise into the sky, coloured by the rays of the sun as he hastens to his setting. Yonder, to the right, is a green plain stretching away to the land of Goshen. The Mokattam hills are rosy in the lustrous light, and the Libyan mountains form a boundary to the beautiful view.

CANON BELL.—*A Winter on the Nile.* Hodder and Stoughton.

By permission of Messrs. Hodder and Stoughton.

The Pyramids

It is impossible to describe the scene that met our view when we emerged from the avenues of date trees and acacias. The sun rose on the left behind the Mokattam hills and illuminated the summits of the Pyramids in front, which lay before us in the plain like gigantic rock crystals. All were overpowered, and felt the solemn influence of the splendour and grandeur of this morning scene.

At Old Cairo we were transported across the Nile to



THE CITADEL, CAIRO.

the village of Gizeh, from which the largest pyramids are called Haram-el-Gizeh. From this spot in the dry season one may ride to the Pyramids by a straight road in an hour or little more.

About thirty Bedwins gathered round us and waited for the moment when we should ascend the Pyramids, in order to raise us, with their strong brown arms, up the steps, which are between 3 and 4 feet high. Scarcely had the signal for departure been given than immediately each of us was surrounded by several Bedwins, who dragged us up the rough steep path to the summit, as in a whirlwind.

The panoramic view of the landscape spread out at our feet riveted our attention. On the one side the Nile valley a wide sea of overflowed waters, intersected by long serpentine dams, here and there broken by villages rising above its surface like islands, and by cultivated promontories filling the whole plain of the valley that extended to the opposite Mokattam hills, on whose most northerly point the citadel of Cairo rises above the town stretched out at their base. On the other side, the Libyan desert, a still more wonderful sea of sandy plains and barren rocky hills, boundless, colourless, noiseless.

DR. R. LEPSIUS.—*Letters from Egypt.* Bohn Library. Bell.

The Fayûm

The Fayûm is a depression apart from the Nile valley. It is shut in on all sides by the desert, save one narrow passage through the hills bordering the Nile valley. It slopes gradually away from the east or Nile side and terminates in a wide, shallow lake with an area of about 78 square miles. The lake water is brackish and undrinkable, but the fish are of the fresh-water type.

The surrounding low hills and desert are sufficient to render the climate more equable than that of the Nile valley and delta, affording protection from the high winds of the one and the fogs and cloudy weather of the other

The fig and grape grow well in the Fayûm, and have a good flavour. The sorghum or large millet grows very well.

COL. J. C. ROSS.—*Scottish Geographical Magazine*, May 1893.

By permission of the Royal Scottish Geographical Society.

The Suez Canal

The Isthmus of Suez is a narrow neck of land, about 72 miles across, connecting Africa with Asia, and separating the Mediterranean and Red Seas; it is chiefly low, sandy, desert land, without the least sign of vegetation, and entirely destitute of drinking water. There were several dried-up lakes, the bottom of some of which were 30 feet below the level of the sea, and as the water from the Red Sea was let into them by making the canal, they now form immense lakes, through which the canal passes. The ruins of many ancient cities are found on the Isthmus, and Port Said, at the entrance to the canal, was founded near the site of ancient Pelusium, which formed a bulwark against invaders at a time when Egypt was the admiration and envy of surrounding nations. Formerly there was a canal in the Isthmus, and some traces of it are still to be found. It was commenced by one of the Pharaohs and finished by Darius; it did not, however, connect the two seas, but only the Red Sea and the Nile. It is recorded that this canal was blocked up by sand in the year 767, and has remained in that condition ever since.

Port Said has well been called the Gateway of the East; it stands on a little strip of land, which separates the Mediterranean from the Lake of Menzaleh, into which flows the Pelusian arm of the Nile. It is said to be as unique, geographically and ethnographically speaking, as it is in the number of diversified forms of wickedness which may be found within its borders. On one side of it are the cheap, temporary-looking brick and iron buildings—the half-French, half-English shops—and so much of the hurry and bustle of Western business life as can survive

under that fierce Egyptian sun ; on the other, the shabbiness, the squalor, and the indolent repose of the Orient.

The mixture of races to be found in the streets of the town is simply bewildering to strange eyes. Half-a-dozen strides take you past as many different nationalities—types of face and build and varieties of costume, from the half-naked Nubian in his leopard skin, with his woolly head bare to the sun, to the sallow Turk in his flowing robes—from the Arab sheik in his picturesque, if not over-clean, turban and burnouse, to Tommy Atkins in his pith helmet and brown holland regimentals. This is what might be expected at the entrance to the great highway between 400 millions of Europeans and 800 millions of Asiatics.

The total length of the canal, from the lighthouse at Port Said to the Red Sea at Suez, is 101 miles ; about one-quarter of the length is through Lake Timsah and the Bitter Lakes ; the width of the canal at the surface through the greater part of its length was 325 feet, with a depth of 26 feet in the centre, and large enough for vessels 500 feet to 600 feet long and 50 feet beam ; the width and depth have been increased during the last few years, and this work of enlargement is still going on. At the entrance to the canal at Port Said two breakwaters are carried out about a mile and a half seawards, enclosing some hundreds of acres as a harbour. The expense and difficulty of procuring stone to build the breakwaters was overcome by making blocks of concrete, 20 to 30 tons each, from sand and hydraulic lime.

I. BOWES.—“The Suez Canal,” *Journal Manchester Geographical Society*, xii. 1896.

By permission of the Manchester Geographical Society.



ADEN, SUEZ CANAL.

III.—WEST AFRICA, THE NIGER, AND CENTRAL SUDAN

Surf on the West African Coast

THE surf on the African coast is ever a wonder and danger. There is no other coast in any part of the world a thousand miles in length, without possessing a cove or harbour where a ship could anchor secure from being rocked by the surf waves. Try along the whole of the Grain, Ivory, the Gold and Slave coasts, and there is not one port. But fortunately for ships trading to these places, there is seldom a hurricane or gale blowing, so that they are able to anchor about a mile from shore. There is never any dead calm. The sea is ruffled in the morning by the breeze from oceanwards; during the night it is moved by the land breeze, so that ships anchoring in the roadstead are ever to be seen rolling uneasily; they are never at rest. Unceasingly the long line of waves is to be traced, rolling onwards towards the shore, gathering strength as they advance nearer, until, receiving the ebbing waters flowing from the beach from preceding seas, there is a simultaneous coiling and rolling, and at once the long line of water is precipitated with a furious roar on the land. Where the water meets a rock a tall tower of spray and foam is suddenly reared, the wave-line is broken and is in mad confusion. Where the beach is smooth sand you may trace a straight unbroken line of foam nearly a mile long.

One may easily understand, then, the trouble and

annoyance trade undergoes on such an inhospitable coast. It would be a drowning matter for a crew of sailors unaccustomed to the surf to attempt to land anywhere between the Sherbro and Lagos, a distance of nearly 1200 miles. The mouths of the insignificant rivers which feed the sea along this distance offer just as dangerous impediments to an ordinary ship's boat as the beach does. A long line of mighty breakers runs across the mouth of each river and forms a bar, which is almost certain death to cross, except in boats especially constructed for the peculiar work, and native canoes. These surf-boats have no straight stems or sterns, the keel is in the shape of a bow, which allows the advancing wave to be well under the boat before its crest lifts it aloft to precipitate it in the deep trough left in the track. A straight-stemmed boat cuts the wave, and its divided crest as it falls reunites and swamps it.

SIR H. M. STANLEY.—*Coomassie and Magdala.* Low.

By permission of Sir H. M. Stanley and Messrs. Sampson Low and Co.

Freetown

Freetown, the capital of the settlement of Sierra Leone, lies at the foot of the lofty ridge of hills from the configuration of which Sierra Leone derives its name (Ridge of Lions). The town is built along the shore about four miles from the mouth of the magnificent estuary formed by the confluence of the Sierra Leone and Rokelle rivers, with their numerous minor tributaries. The mouth of the estuary is protected by a sand-bank extending nearly across the harbour, leaving, however, a perfectly safe channel of sufficient width near the Lighthouse Point. Passing slowly up to the anchorage, one is struck with the extreme beauty of the surrounding country. On the right hand side innumerable small bays open out abruptly in diversified form, now leading to a gently ascending hill, now varied by bold crag and jutting

headland, while the thick and the massive silk cotton-trees, with their curiously horned trunks, form a background frequently relieved by patches of rude cultivation on which farmhouses and negro villages are picturesquely situated. To the left of the town, which is situated on a promontory, the winding river is seen, its broad expanse dotted with numerous islets covered with the pliant, ligneous mangrove, on whose interlaced roots oysters cluster in profusion, while the dense bush affords a safe retreat to the monkey, the crocodile, and birds of brilliant plumage.

G. A. BANBURY.—*Sierra Leone*. Sonnenschein.

By permission of Messrs. Swan Sonnenschein and Co.

The Market at Freetown

We entered the fruit and vegetable market, a neat and well-paved bazaar, surmounted by a flying roof, and pierced for glass windows. The building was full of fat, middle-aged negresses, sitting at squat before their "blyes," or round baskets, which contained a variety and confusion of heterogeneous articles. The following is a list almost as disorderly as the collection itself. There were pins and needles, yarn and thread, that have taken the place of the wilder thorn and fibre; all kinds of small hardware; looking-glasses in lacquered frames; beads of sorts, cowries, and reels of cotton; pots of odorous pomatum, and shea-butter nuts; feathers of the plantain-bird, and country snuff-boxes of a chestnut-like fruit, from which the powder is inhaled through a quill; physic-nuts, a favourite but painful negro remedy, etc. Amongst the edibles appeared huge *achatinæ*, which make an excellent soup, equal to the French snail; ground-nuts; very poor rice of four varieties, large and small; cheap ginger, of which the streets are at times redolent; the kola-nut; skewered roasts of ground-hog, a rodent that can climb, destroy vegetables, and bite hard if necessary; dried bats and rats, which the African as well as the Chinese loves; and sun-cured fish, preferred when high. From the walls hung dry goods, red woollen night-

caps and comforters, leopards' and monkeys' skins, etc. Upon the long tables or counters were displayed the fruits and vegetables. The former were the custard apple or sweet-sop, the sour-sop, citrons, sweet and sour limes, and oranges, sweet and bitter, grown in the mountains; bananas, the staff of life on the Gold Coast, and plantains, the horse-plantains of India; pine-apples, more than half-wild; mangoes, terribly turpentine unless the trunk be gashed to let out the gum; "monkey plums," or apples and "governor's plums." The common guavas are rank and harsh, but the strawberry-guava, as it is locally called, has a delicate, sub-acid flavour not easily equalled. The alligator-pear is inferior to the Mexican. Connoisseurs compare its nutty flavour with that of the filbert, and eat it with pepper, salt, and Worcester sauce. The papaw should be cooked as a vegetable and stuffed with forcemeat. The leaves are rubbed on meat to make it tender, and a drop of milk from the young fruit acts as a vermifuge. The flesh of the granadilla, which resembles it, is neglected, while the seeds and their surroundings are flavoured with sherry and sugar. The chief vegetables are the watercress, grown in private gardens; onions, large and mild as the Spanish; calavances, or beans; yams of sorts; bitter cassada and the sweet variety; garlic, kokos, potatoes; tomatoes like musket-balls, but very sweet and wholesome; and the batata, or sweet potato. The edibles consisted of "fufu," or plantain-paste; "cankey," a sour pudding of maize flour; ginger-cake, cassava balls, and sweetened "agadi," native bread in lumps, wrapped up in plantain leaves. Toddy was the usual drink offered for sale.

BURTON and CAMERON.—*To the Gold Coast for Gold.* Chatto and Windus.

By permission of W. H. Wilkins, Esq., and Messrs. Chatto and Windus.

Ashanti

Ashanti, which is situated only a few degrees to the north of the equator, is essentially a forest kingdom, and lies entirely within that belt of primæval forest which ex-

tends for over 1000 miles along this part of the west coast of Africa. The forest, only a part of which is occupied by Ashanti, has a breadth of about 300 miles. The surface of the country, except in isolated hilly districts of small area, is undulating, the watercourses being generally broad and of a swampy character. Save where human hands have made a clearing, the forest, dense and tangled, everywhere covers the face of the land. Every few miles the path leads to a clearing in the forest, where grow the trees and plants on which the natives' existence depends—the plantain, and banana, the papaw, some coco-nut trees, and patches of yams. In the centre of the clearing is the village, the houses of which are all made of red and yellow mud, with roofs of closely knitted branches and vines.

MAJOR C. BARTER.—*Scottish Geographical Magazine*, Sept. 1926.

By permission of the Royal Scottish Geographical Society.

Cocoa in Ashanti

The Coomassie of to-day is a garrison town designed on garden-city lines and occupying an extensive clearing. It is well planned, many large buildings of a permanent character have already been erected and others are springing up rapidly, and there are numbers of roads leading out in all directions to the surrounding country. Special quarters, devoted to special purposes, have their individual characteristics; thus, large "factories," similar to the commercial premises known by that name in the Gold Coast, are features of the European business section; bazaars and market-places are the pulse of the crowded native quarter; the Fort, officers' bungalows, and barracks, typify the Government centre; and pretty country houses, situated in spacious grounds, are conspicuous in the European residential reserve. But whilst Coomassie has something different to show us at every turn there is a charm common to every part of the town. . . . The flourishing and progressive condition of Coomassie as we find it to-day is due to the successful development of the



AN ASHANTI RIVER.

cocoa industry by the Ashantis as farmers and by the British as organisers of the export trade. . . . From Coomassie we make numerous excursions to the surrounding country. Everywhere we go we see multitudes of cocoa trees, alternating with stretches of forest or occupying a clearing in the heart of the jungle. The situation of the cocoa farms, the numerical strength of the trees, methods of cultivation, the way in which the crop is harvested, fermented, dried, and taken to market, and the quality of the beans, are all reminiscent of cocoa production as we have become familiar with it in the Gold Coast Colony. We are constantly being confronted with evidence which goes to prove that Ashanti, no less than the neighbouring colony, is richly endowed by Nature for cocoa production. . . .

Ashanti has struck us as being quite as rich an agricultural country as the Gold Coast. Our peep at the Coomassie Agricultural Station strengthens this impression. Here, where the land is cultivated with knowledge and care, we are in a veritable paradise.

EDITH A. BROWNE.—*Cocoa in Peeps at Industries*, 1920. A. and C. Black, Ltd.

Lagos

The trade of Lagos is extensive, and its strategical importance is greater still. It commands the shortest routes to most of the Niger basin, the Yoruba country, Hausaland, and the kingdom of Sokoto, all fertile regions peopled by Moslem races very far removed from savages, and which will one day form an immense market for our goods. We have only time for a passing glance at its hot streets, and the inevitable steamy haze that rises from the foul lagoon; the Yoruba and the Hausa police, and the market, where you may see representatives of endless races from 1000 miles of hinterland—turbaned Moslems, swarthy descendants of the Arabs, half-naked bushmen, and savages of the Lekki coast.

A Lagos rubber forest is a striking sight. The creepers, many of whose stems are almost as thick as a man's leg, crawl and plait themselves like twining serpents about the trunks of the trees, hang in festoons from their mighty limbs, and wind in knotted tendrils about the buttressed roots. Their dark green glossy leaves, closing the openings between the branches, shut out the light of day and wrap all below in dusky shade, while the rank odours and smell of steaming earth are almost overpowering. Here and there are clusters of pure white star-cupped flowers, or bunches of fibrous shelled fruit resembling an orange, whose inside pulp is sweet, with an acid sweetness, and tolerably palatable. There is, however, something unwholesome about the rubber vine, and I have heard the native gatherers say that where it flourishes the black man dies; while, with the exception of troops of chattering monkeys, who delight in the fruit, it is seldom that the silence of a rubber forest is broken by bird or beast.

HAROLD BINDLOSS.—*In the Niger Country.* W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

This volume is full of graphic descriptions of West African scenery and life, too numerous to mention in detail.

Benin River and City

Like all African rivers on the west coast, the Benin is approached by a bar, the width of the navigable part being about half a mile, with a depth of from 13 to 14 feet of water at high tide. The whole of this part of the coast is one extensive mangrove swamp, intersected by a network of creeks. These mangrove swamps are veritable hotbeds of fever, and in consequence this part of West Africa ranks among the most unhealthy places in the world. After crossing the bar, and ascending the river for about 5 miles, we come to the European factories, which are situated at intervals for several miles along the river, all being on the right bank. A few miles up the river is the Gwato Creek, the waterway to the town of that name, the

landing place for Benin City. Five miles more sees the last of the mangroves ; the ground becomes firmer, and the banks higher, the foliage being chiefly palm-trees. The scenery varies little. The river gets narrower and narrower. Passing a few small towns and villages we reach Sapele, about 50 miles from the mouth of the river, where the bifurcation of the two arms of the river takes place. We now enter the forest region, the country being one impenetrable forest, with small clearings here and there, where the towns and villages are built. The trees are magnificent, the most noticeable being the cotton and mahogany. As we follow the stream up the northern arm the water gets clearer and clearer, being covered with masses of lovely white lilies ; the banks become higher, and are covered with exquisite foliage. You see here and there long, high walls of beautiful ferns stretching from tree to tree. The banks on each side are covered with orchids, flowering trees, and shrubs of every kind. The air is simply alive with the most gorgeous butterflies. The river is now very narrow and twisty, there being sharp turns every few hundred yards. There are several towns, or rather villages, on each bank, all being oil markets. About 30 miles from Sapele is Sapoba, where the river ends for navigation. I traced the stream still farther by wending my way through the forest trees in a small canoe, and reached a spot about 3 miles farther on, about an hour's walk from the actual source of the river. This was described as a large pool, in which the water bubbled up out of the ground.

Returning to Sapele, let us now ascend the Ethiope. The forest scenery this way is even more lovely than that already described. After reaching Eku we get into a canoe and paddle up stream, reaching the Sobo plains about 9 miles farther on. They extend as far as the eye can reach, there being no signs of either animal or human life. These plains are covered with long grass, the soil being sandy, with clumps of trees dotted here and there. Another 9 miles or so brings us to Demovia, the stream in some of the

narrowest places approaching a torrent. From here we went 5 or 6 miles inland, passing through many well-kept farms, chiefly pepper plantations. There are no roads, the only substitutes being tracks in the forest, on which you have to walk in single file. Nearly all communication is carried on by means of the waterways. Beasts of burden of any kind are unknown, all carrying being done by the people.

Benin City lies about 25 miles from Gwato, the whole route, with the exception of the last mile or two, being through a dense forest. Just before reaching the city we had to pass through rather an unpleasant half-mile of open country. The path was strewn on both sides with dead bodies in every stage of decomposition; skulls grinned at you from every direction. On reaching the city we found the king had told off a couple of very decent houses for our use. These houses were built of red clay. There were two fair rooms, and many uncanny alcoves. Skulls, human and otherwise, hung round promiscuously. The walls were adorned with the impression of a very large hand in lime and blood. The roof was a thatched one, full of creeping things. Human sacrifices are of frequent occurrence, and the rule is one of terror. I have not told half the horrors I saw and learned about in the few days spent in that city of skulls.

H. L. GALLWEY.—*Geographical Journal*, Feb. 1893.

By permission of the Royal Geographical Society.

For fuller particulars of mangrove swamps, see pp. 82, 83.

For European factories, see p. 75.

For the combination of dense forest environment and human sacrifice, see p. 64.

Handicrafts of a West African Tribe (Mendi Country)

The people have a knowledge of cotton raising, spinning, and weaving, together with dyeing. The

cotton-seed is apparently planted at the same time and place as the rice, and so comes on as an after-crop when the rice has been gathered. Very little attention is given to it, and when ripe it is roughly collected and tied up in bundles. The staple is inferior and short. There are two kinds—one producing a white and the other a pale brown. The separation of the seed is largely done by children, the carding and spinning by the women. The carding is done by springing the cotton on the tight strap of a small bow, the strap being drawn between the finger and thumb as if for shooting an arrow. The uncarded cotton, being twisted round the strap, is straightened out by the repeated process of springing the bow. The spinning is done with rounded pieces of hard wood about 8 inches long, and the size of an ordinary penholder. This is weighted about an inch from the bottom with a small piece of soap or stone. It is now a sort of teetotum, with an elongated pivot; and this is the sole instrument used in the production of the thread. It is kept spinning with the finger and thumb on a shell, or some other smooth cavity, to prevent it from wandering, and a small piece of bees'-wax is added to the top to grip the thread being made. Provided with a low seat, the operator arranges this simple instrument conveniently on the right side, while the carded cotton is loosely held in the left hand; with a swift and dexterous spin the thread is drawn out and started, at the same time being rapidly and with astonishing evenness regulated with the fingers to the required size. Dyeing is also the work of the women, and is chiefly done in the yarn or "thread," as they call it. The dyes are purely vegetable, and they are only able to produce a very limited range of colours—the pure white, undyed; the creamy white, from inferior cotton, also undyed; bajjie, a good yellow; kaffey, a very passable brown; fandee lay, a most commendable indigo; and fin mani bui, a watery sky blue. Red is supplied by the purchase of red wool caps from traders. These are frayed out and mostly worked into the finished cloth with the



Rev. W. Vivian, F.R.G.S.

A MENDI LOOM.

From the Journal of the Manchester Geographical Society.

needle. They have no red of their own, and have never learned to utilise for the purpose the camwood so common in their own forests. With one or two exceptions the dyes are used cold.

Some of the old Kaw-Mendi women are very skilful in setting a fresh dye-pot, or in restoring it when "sick." Their method in dyeing is to saturate the thread and dry it, repeating the operation until the required depth of colour is obtained.

Nothing can be more primitive than the Mendi loom. It hangs under a shelter tripod of sticks like a gipsy's kettle, and the motive power is applied in the simplest way by two treadles worked by the right foot. The shuttle is a stick about 9 inches long, and is passed to and fro as the treading separates the warp. The accompanying photo may be taken in lieu of a longer explanation, and will probably convey a clearer impression. The cloth is woven in strips, which vary from 6 to 10 inches wide. It is then cut to suit the length of cloth required, and the strips are sewn together till the requisite width is obtained. In weaving designs they sometimes count, but oftener the pattern is gauged with a notched stick.

Fibre-work must not be forgotten in speaking of the handicrafts of the Mendis. The country is very rich in fibres, some of which, the bamboo palm chiefly, the natives know how to convert to their own uses. In this way they make mats, ropes, twines, different kinds of fishing nets, and most useful hammocks. In these they suspend themselves, luxuriating the whole day through—smoking, drinking palm wine, hearing palavers, or imposing fines. They know no more haste than eternity, and are no more flurried than if the world had not started yet.

Wood-making does not flourish to any considerable extent, but I could produce some interesting examples of the Mendi's capacity for working in iron. The smith's shop is invariably outside the town, on account of the danger from his fire. The majority of them appear to be itinerants, settling only for brief periods at given places.

Iron is found in considerable quantities in many places among the hills, but the quaint little blast furnaces are now no longer in much requisition. The introduction of English iron has superseded the productions of the native smelter. Hoop-irons and rods, specially in the farming season, may be found in every caravan with its face towards the interior. Farm tools, clumsy needles, arrowheads, knives, etc., etc., are made by these smiths, in addition to which some of them have the gifts of the brazier as well. With a rough hammer, a stone for an anvil, a charcoal fire (certain trees charred for the purpose), and a skilfully constructed dual bellows, they can produce some very commendable work. I have noticed, however, that they do not appear to be familiar with hardening processes. Their cutlass, for instance, is a very limp and yielding affair; yet there can be no question but that, in their own hands, it is better for the forest clearing than the best English steel. We have seen them at work side by side in the Mendi bush, and the best English axes made a sorry figure beside the native-made tools, which, being tough rather than hard, were not so readily damaged by the iron woods upon which they were used.

A word on clay-working will about complete the list of their handicrafts; their talents in this direction are almost exclusively exercised in pot-making. They range in size from the six-gallon dye pots down to those which will only contain a pint. The smaller sizes are used for cooking soup, the next for boiling cassada or rice, while the next larger are devoted to the storage of water in the house. To this latter use they are eminently adapted, keeping the water delightfully cool. They are found in nearly every dwelling, with a small gourd floating on the top of the water—a convenient arrangement for thirsty wayfarers in a hot country. The most curious thing about this clay-working is that they do not appear to be acquainted with anything that can be dignified by the name of tool. The clay is of a fine quality and prepared for use by beating with a flat stick and treading with the feet; having been

mixed to the proper consistency, it is rolled into worm-lengths varying in diameter according to the size of the proposed pot. The clay worms are then coiled round and round until the bottom is of the required size. The clay is pressed into cohesion with the fingers, then the body of the vessel is slowly built up in the same way; afterwards the interstices are carefully filled up within and without, for this purpose a small smoothing stick being used. Finally the surface is finished off with a wash of finest clay. These pots are literally built; the Mendis do not appear to have any knowledge whatever of the wheel. To fit them for use they are slowly evaporated in a cool place, being gradually advanced till they can bear the exposure to the tropical sun. What remains, after the sun has done its work, is completed by the application of wood-fires; they have nothing equivalent to a kiln, and are unacquainted with the art of glazing.

REV. W. VIVIAN.—*Journal of Manchester Geographical Society*, 1896.

By permission of the Rev. W. Vivian and of the Manchester Geographical Society.

From the Coast to Kano

We have widened our horizon as regards the extent of the West African oil-palm forests by passing through one of the great Nigerian belts of oil-palms, stretching from the coast for about 200 miles inland. We have seen the palm forests merging into mixed forests, and these giving place to woodlands and moorlands containing clearing after clearing planted up with cotton, another oil-giving crop. We have skirted the dry open forests of Northern Nigeria wherein, some 600 miles from the coast, flourishes the Shea butter tree; and we have passed beyond the railside reach into broad pasture lands, in the midst of which we are now looking upon the strange sight of numerous herds of cattle.

Thus we are nearing Kano, with many a joyous memory of ever-changing details in the panorama of oil forests,

cotton fields, mixed forests and pasture-lands *en route*, with many a vivid mind picture of countless little villages whose stockade-enclosed huts are square-shaped way down south and round up north, of a few big open towns, followed by the first appearance of a great-walled city, and of a succession of native races typified by the variation of countenance, physique, and costume as revealed by the crowds at the different railway stations.

EDITH A. BROWNE.—*Vegetable Oils in Peeps at Industries*. A. and C. Black.

Ground Nuts in Kano

Kano, consisting of a newly built European town, a Syrian quarter, an Arab quarter, and the old city, is scattered over a vast sandy plain. Its site, in the heart of Africa, is some thirty odd miles only from the southern boundary of the Sahara.

Hotels are conspicuous by their absence throughout British West Africa, so it is not surprising that far-away Kano cannot yet boast of one. We are staying with very kind friends, who were complete strangers to us a few hours ago, and we have just had time to begin to find our bearings.

A short, sandy road from the railway station leads to the sandy main thoroughfare of the modern town. On one side of the thoroughfare a sandy turning or two lead to stores which have been crowded out of the highway; on the other, several sandy compounds provide passage-way between stores in a row, and all lead past big warehouses in sandy yards to the sandy expanse known as the Ground Nut Market.

In one morning we have seen often enough never to forget that the principal commodities which come into Kano for export are ground nuts and skins, and that the principal goods which arrive from overseas for sale to the natives are cotton materials, mostly from Manchester. The great bales of cotton stuffs have travelled by steamer and railway, and we are quite familiar with the European look

of these well-wrapped packages, held within the protecting grip of strong iron hoops.

The ground nuts come from everywhere within a 30 to 40 miles' radius round Kano.

EDITH A. BROWNE — *Vegetable Oils in Peeps at Industries*, 1924.
A. and C. Black, Ltd.

A West African Native Market

The up-country markets interested me greatly. These markets, which are of weekly recurrence, are always held in the open, under large trees. At one, held under a large banyan, there must have been a thousand people present. It was not known by the people that I was going to attend this market, and their surprise upon seeing a white man suddenly burst upon them for the first time can be more readily imagined than described. The brisk trade, of which I caught a glimpse, immediately ceased, and I became the object of universal attention. Here is my list of objects offered for barter: cotton in the raw state; country cloths, made up; cloth in long lengths, about five inches wide, from the loom; spun cotton thread wound on spindles; blue dyed ditto in skeins; indigo leaves, dried, for dyeing; tobacco leaves, dried; palm-nuts, palm-oil, palm-nut oil; country-made iron; clean rice, rough rice, ground nuts, cus-cus, Guinea corn, bananas, pumpkins, jakatu (a kind of bitter tomato), boiled sweet potatoes, dried okra, cassada, fowls, dried flying ants, dried rats on skewers, dried fish, good country mats, native pottery, chiefly bowls, in large quantities; a few cattle, sheep, and goats, and a small quantity of salt and gunpowder.

The chief currency was iron in long strips, like a T-square, one strip of which I considered equal to a penny, and imported salt, which was much valued; but everything passed in barter. In the bush I met several native ladies, who were going to market with their purses under their arms, in the shape of a mat containing perhaps a couple of dozen iron strips. Although there was a great din in the

market, there was no disorder of any kind, in spite of there being people of many different tribes present, many of whom had walked in from considerable distances.

T. J. ALLDRIDGE.—*Geographical Journal*, August 1894.

By permission of T. J. Alldridge, Esq., and of the Royal Geographical Society.

Compare this with Freetown market, p. 62.

Economic Products of West Africa

Coffee will grow well anywhere, especially in the clearings of the virgin forest; in fact the best in the world is produced in Liberia, but owing to the universal difficulty about labour very little is sent over-seas.

Cotton grows wild throughout the greater portion of the Niger basin, and in the time of the American war a large quantity was shipped by way of the Gold Coast and Lagos. It is also sent home periodically at present; but the indolence of the negro prevents the development of a prosperous industry, for, as he cannot be induced to undertake systematic care of the bushes, the staple is short and brittle. The Moslems of the hinderland, however, cultivate it carefully, and, weaving it in quaint but ingenious handlooms, send down a beautiful fabric dyed blue with indigo to the factories, as well as northwards across the desert. Almost as far as the Nile, and certainly in Southern Marocco, the blue haiks and burnous of the semi-Arab and Moorish tribes are the products of craftsmen in Kano and Sokoto, and this "country cloth," as it is called, is worth much more along the coast than any turned out in Manchester.

There are precious gums of many kinds, from copal, unequalled as a body for varnish, to acacia, gums, and frankincense, worth almost any price from 90s. to 320s. a cwt. These, however, do not, as a rule, come out *viâ* the delta, but from the higher waters through Sierra Leone, or southwards across the Gold Coast hinderland. Senegal,

especially, ships large quantities of precious gums obtained from near the source of the Niger.

Then there are the dyes, the bright orange-red barwood, worth up to £5 a ton, and the beautiful yellow-pink camwood, costing as much as £30 a ton, besides split pieces of ebony at about £13. All these are sought after by turners of delicate woodwork, but the trade is crippled by the negro's distaste for labour, and timber-cutting is no child's play in the tropics. There are great mahogany forests which lie idle through dearth of hands to work them, although now the Gold Coast ships this wood, notably from Axim.

Indigo also grows wild in many places, in the shape of a woody creeper, and is largely used by the Mahommedans.

The wonderful properties of the kola-nut, which were well known to the Arabs 700 years ago, are just now beginning to be appreciated at home, and this article may be found every here and there along the Niger. All these products of the Niger region, with many others as well—such as ginger, ground-nuts, copra, gold dust, and feathers—are largely exported from its upper waters *viâ* Sierra Leone, the Gold Coast, and Senegal, or from the other end through the Lagos colony and the Niger Coast Protectorate. Before all of these, however—and probably destined to become more valuable than the present staple, palm-oil—is rubber.

HAROLD BINDLOSS.—*In the Niger Country.* W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

For the manufactures of the hinderland, see pp. 94-97.

Rubber

The kewattia, or rubber tree of West Africa, is one of the most beautiful trees of the forest, usually growing to the height of from 40 to 60 feet. The supply of Freetown market for the most part comes from the hinderlands of Sierra Leone, and from the Futa country in the French protectorate further in the interior.

The dry period from November until May is the gathering season. Native crops supervene and control the sale of the output of their respective territories. The method of gathering the sap is very simple. The body of the tree is tapped and the juice flows until exhausted ; later new incisions are made. The juice is usually caught in cups or calabashes attached to the tree, so as to prevent impurities appearing in the rubber. The native, in his efforts to increase his stock, frequently bleeds the roots as well as the body of the tree : this is fatal to the tree. The product is known as root-rubber, and besides containing quantities of impurities, is very inferior to any grade of tree rubber and would be refused altogether by local buyers, in order to discourage the destruction of the forest, were it not for the sharp competition for export trade.

Consular Reports, April 1900.—Quoted, *Journal of School Geography*, September 1900.

For a more graphic description see BINDLOSS, *In the Niger Country*, pp. 311-323.

Compare also *Descriptive Geography of South America*, pp. 105-108.

The Oil-Palm

The nuts grow in clusters beneath the fronds of the oil-palm, which, in that part of Africa lying between the Cameroons and Senegal, at least, only grows within a certain distance from the coast. Once the land becomes drier the oil-palm disappears. In the Niger region it is rarely met with more than 150 miles from the sea, while in Lagos the boundary is considerably less than half that distance. The whole fruit in appearance is something between a pine-apple and a gigantic fir-cone with the interstices filled in ; and this outer cover contains many “nuts,” though the term is not very appropriate, for each resembles a yellow plum more than anything else. The skin is soft and silky, tinted gamboge and vermilion, and beneath it there lies a mass of fibre and yellow grease. The bushman either scrapes this away or stamps the whole affair up in a

foot mortar, and the pulp is boiled ; when the grease rises to the top it is skimmed off, and becomes the best palm-oil, worth from £16 to £22 a ton. Then there is still left an inner shell something like a walnut, which is cracked, and the two or three little black kernels it contains are flung into another calabash. These kernels are shipped to Great Britain and the continent—the latter principally—in millions of tons, and in Hamburg and Antwerp are pressed for an oil inferior to the outer layer. The whole process is very simple, and yet it is not accomplished without loss of life, for slaves are sold to gather it, and the native markets where it is sold are periodically fought over. Marauders armed with flint-lock guns waylay the caravan trains bearing it to the coast, and the Europeans who ship it home suffer many things and perish of fever.

H. BINDLOSS.—*In the Niger Country.* W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

The Kola-Nut

There is one article which far surpasses in importance every other article of commerce throughout the whole of the Western and Central Sudan. Though not found originally in any part of the Hausa States, there is, nevertheless, no village or hamlet, however small or remote, in which it is not constantly used. This article is the kola-nut. It is the product of a tree called *Sterculia acuminata*, which is found in greatest perfection in the country to the back of the Gold Coast colony. The fruit resembles a large-sized chestnut, and is encased in long pods, each containing four to six nuts. It grows like chestnuts, in bunches of three or four on the tree. Round the kola-nut there is usually a black line, sometimes two, at which it can be divided or subdivided. The colour is generally brick-red, though in some countries, especially in the far west, there are all sorts of intermediate shades between red and white. In the country

of the Bambarra tribe the kola-nut plays an important part in private and public life ; the colour in this case has a special significance ; a white kola is always a sign of friendship and hospitality ; proposals of marriage, acceptances or refusals, defiances, declarations of war, etc., are conveyed by the sending of a number of kolas of the prescribed colour. The kola from Gando, which is of a uniformly red colour, is the most frequently brought to Kano, as it keeps better than any other. The most



KOLA NUTS.

minute care and attention on the part of the merchant is necessary in order that the kolas may reach the market in good saleable condition. They are carried for the most part in Kano-made baskets, each of which contains three or four thousand kolas, while two of them form a donkey load. If treated with the utmost care, the nuts may be preserved fresh two or even three years ; but in order to secure this they must be kept constantly damp. If exposed to the air and allowed to dry, the kola opens along the black line mentioned above, wrinkles, and becomes as hard as wood. In this condition it has lost ninety per

cent of its value. During the march the nuts are packed in baskets and covered with fresh green leaves. Every four or five days they ought to be repacked, in order that the leaves may be renewed, and that the nuts which are touched with mildew may be removed. The large profits obtainable on the sale of those which reach the various markets in good condition compensate for the risk and trouble of their carriage. At Gando the average nut costs 5 cowries; at Say, on the middle Niger, 70 to 80; at Sokoto, 100; at Kano, 140 or 250; at Kaka, on Lake Chad, 250 to 300.

CANON C. H. ROBINSON.—*Hausaland*. Low.

By permission of Canon Robinson and Messrs. Sampson Low and Co.

The Mouth of the Niger

Of the great rivers that I have seen—the Irawadi, the Ganges, the Zambezi, the Indus, and others—none has ever so excited my imagination by the size and the vast volume of water which it bears to the ocean as the Niger. For over 100 miles the knowledge that the mighty river up which we are travelling is but one of a score of the mouths of the Niger is ever present to the mind. These various outlets of the river extend along some 120 miles of coast-line, and form great ocean creeks, while the breadth of the larger channels varies from half a mile or less to over a mile in breadth. Not till we arrive at Abo—some 100 miles from the sea—do we reach the single channel from which this network of streams divides. Here, therefore, the river widens out, and presents the appearance of a comparatively narrow, but illimitable lake. Long before this point is reached, the fantastic mangrove thickets have given place to dense masses of exquisite woodland forest. For those who are unfamiliar with its eccentricities, the mangrove merits a passing word of description. Over the impenetrable primæval swamps or low-lying lands submerged by the rising tide or the winter floods, the dark, silent mangrove forest keeps watch. No foot of

man or beast has trodden large areas of these pathless thickets—save perhaps some stray, homeless elephant—since the days of an elder creation. The mangrove trees themselves seem to have lost count of the vegetable proprieties, and stand, as it were, on stilts with their branches tucked up out of the wet and leave their gaunt roots exposed in mid-air. On their water-washed roots shell-fish are fastened, so that the Irishman's paradox of oysters growing on trees is here fulfilled.

To such a medley of unsightly tree-forms the contrast of the bank of forest which borders the river-side when the mangrove swamps are past is a welcome and pleasing contrast. This fringe of forest is exquisite both in colouring and form. In colouring, because with every tint of green are masses of scarlet and yellow and purple blossom; in form, because, interlaced with the giant mahogany and cotton-trees are the waving, fern-like fronds of the oil-palm, and the still more beautiful raphia. The earlier reaches of the Niger are therefore a panorama of beautiful colour, through which the mile-broad river flows.

SIR F. D. LUGARD.—*Geographical Journal*, September 1895.

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Compare this and the following with the description of the Congo, pp. 137-140.

Scenery of the Niger

The delta, with its apex extending towards the north, has a length of about 80 miles, and presents probably as repulsive an aspect as any similar region on the face of the globe. In its southern part, where it is but in the first stage of becoming land, there is nothing but slimy mud grasped by the mangroves, which prevent its being washed away into the ocean. The atmosphere reeks with pestilential odours.

Hardly a sound breaks the death-like stillness which prevails, unless it be the ear-piercing shriek of a parrot,

or the equally shrill bark of a monkey, while almost the only other sign of life to be seen is the kingfisher in rapid flight along the surface of the river. In this vile region man finds it impossible to live. It is only towards the apex of the delta that he can venture upon waging war with Nature with the slightest hope of wresting from her the wherewithal to live. In this latter part, indeed, Nature raises a rich and golden crop of palm-oil nuts; and these tempt the almost fever-proof natives to brave the malaria and all the discomforts of an annually overflowing river. But though I depict the delta in these uninviting colours, it must not be supposed that these would be the impressions acquired by the traveller steaming up the river. On the contrary, he would only admire the primeval forest, kaleidoscopic in its arrangement of foliage, though monotonous in colour.

The river, shaded by its canopy of trees, and winding in sharp silvery curves, presents to him many a pleasant picture, and he might imagine the place an ideal Arcadia. Let him land, however, and only too soon would he be disillusioned. Tangled bush would meet him in the face. This he might perhaps penetrate, but only to find himself surrounded by an under forest of weird aerial mangrove roots; while at each step he would sink in slimy ooze, from which would bubble out malarious and malodorous gases. Myriads of mosquitoes, disturbed in their gloomy resorts, would settle on him, and drive him distracted by their bloodthirsty attacks. Parrots, affrighted in their solitary haunts, would fly away with ear-piercing shrieks; and monkeys, indignant at the unwonted intrusion, would fill the formerly silent solitudes with their noisy clamour. Baffled in his attempts, and maddened by his insect tormentors, the adventurer would soon gladly return to his launch, a sadder and a wiser man.

On leaving the delta and entering the second region, a brighter scene meets the eye. Instead of the narrow branch, which so far we have followed, we now steam into the broad bosom of the undivided river. No longer con-

fined to a leafy tunnel, we breathe with pleasure the river breeze that daily stirs the water into ripples, and tempers the excessive heat of the sun.

Here are arboreal growths of great size and beauty, and of all conceivable forms, from palms the most graceful and feathery to trees so densely foliated that no ray of the sun passes through. Arranged in ever-varying groups, they present pictures of infinite attractiveness; numerous clearings tell of a successful war with Nature, which here with less danger and trouble yields up her fruits to the rude efforts of the barbarians; villages peep cosily from the protecting shadow of the forest, and groups of scantily clothed inhabitants watch with lazy indifference our progress up the river, pausing in their various primitive occupations to see if we propose landing. Children, naked as the day they were born, dive or swim, with much fun and splashing, near the banks, while gliding along before us to plantations are numerous small canoes propelled by paddles. In less frequented parts, the river is made interesting by the sight of crocodiles lying like stranded logs at the edge of the water, or of hippopotami, now sunning themselves on the banks, anon, for greater safety, showing nothing but their heads in some deep back-water of the river. The many sand-banks which diversify and break up the river at this period of low water, are dotted with numerous waterfowl, which further enliven the scene by rapid flights overhead; while far up in the heavens, kites and other birds of prey wheel round in graceful circles, watching their opportunity to sink earthward.

This middle zone, 140 miles in length, is flat over the greater part of its area, gradually, however, passing into low undulations, as it approaches the interior plateau. Towards the south the country is flooded when the Niger is at its highest. The soil is sandy, and not rich in fertile ingredients; but from the superabundance of heat and moisture, plenty of food is obtained with little toil, this district being specially famous for its splendid yams, the

staple food of the region. The inhabitants are ugly and repulsive in the extreme—mostly cannibals.

Towards the northern limit of this middle zone the country begins to undulate, rising here and there over 100 feet above the level of the river; the trees, growing in less favourable conditions, rarely reach the magnificent development which obtains further south; altogether, Nature presents a stern aspect.

These changes usher in a third zone of our river journey. At a distance of about 200 miles in a straight line from the coast the land suddenly springs into a series of bold picturesque mountains, which form the commanding outworks or escarpment of the inner low plateau region. Through these mountains the Niger finds its way by a narrow, veritably adamant gateway.

Like huge pillars on either side rise isolated peaks and table-topped mountains, grand in the extreme in their defiant barren ruggedness, though graced by pliant creeper and dark-foliaged shrubs. The river channel itself, as if to render further advance impossible, is studded with small islands and hidden rocks, round which the river sweeps and swirls in fierce currents, as if in anger at being obstructed.

Under careful pilotage this dangerous part is safely breasted, and, as the shades of evening fall rapidly over rocky hill and river reach, we breathe again, and steam into the lake-like expanse formed by the confluence of the Niger with its great eastern tributary the Benue, at the now well-known station of Lokoja.

In passing through this rocky and dangerous barrier we leave behind us the coast regions, and enter the Central Sudan; and the changes which occur, whether physiological or ethnological, are striking in the extreme. We exchange the mangrove swamps and flat alluvial plains, but recently acquired from the ocean, for a plateau region carved by the ceaseless action of natural agents, through unknown æons, into deep valleys, rugged peaks, or picturesque mountain ranges. Instead of the primeval

forest with its majestic trees, evidence of a young and virgin soil and congenial climate, we are now surrounded by more stunted and gnarled growths, indicating a drier climate and more arid soil. The palm-oil tree has practically disappeared, and, for purposes of trade, is replaced by a tree of almost equal value,—but of different family,—which supplies the shea-butter of commerce. Sorghum or Kaffir corn, along with maize, supply the natives with their chief food instead of yams, while cattle, sheep and goats, horses and donkeys, become for the first time important elements in the scenes which attract our observation.

But it is in the people themselves that the most remarkable differences are noticeable. The influence of natural environment, on the mental and physical status of the natives, applies here with great force. A denser population, in conjunction with a soil which is less productive, and a climate less adapted to producing luxuriant tropical growths, while on the other hand greatly more healthy and exhilarating, have combined to make the struggle for existence more difficult, with the consequence of developing a higher type of man, mentally and bodily.¹ We are still dealing with negroes, but how different they are. Behind us are the unwashed, barbarous, nearly naked tribes of the coast region, with fetishism, cannibalism, and the gin-bottle in congenial union; before us lies a people astir with religious activity and enthusiasm, and wonderfully far advanced in the arts and industries. In well-governed empires, great towns have sprung up which ring with the stirring din of a hundred industries. Before the watchword of Islam and the cry, "There is but one God," fetishism and all its degraded rites have disappeared like a black fog before a healthy heaven-sent breeze and a blazing sun. Whatever may be said of Mohammedanism in its birthplace and its chief seats in the present day, there can be no doubt that it has a great living influence for good in these semi-civilised regions of the Central Sudan. It supplies the tie which binds a

¹ Compare with the forest tribes of Ashanti and Benin City, pp. 63, 67.

hundred alien peoples together into great empires, and which is rapidly transforming the whole political aspect of Africa north of the line.

JOSEPH THOMSON.—*Scottish Geographical Magazine*, 1886.

By permission of the Royal Scottish Geographical Society.

The Niger at Segu

Just before it was dark we took up our lodging for the night at a small village, where I procured some victuals for myself and some corn for my horse at the moderate price of a button, and was told that I should see the Niger (which the negroes call Joliba, or the great water) early the next day. The thoughts of seeing the Niger in the morning, and the troublesome buzzing of mosquitos, prevented me from shutting my eyes during the night, and I saddled my horse and was in readiness before daylight; but, on account of the wild beasts, we were obliged to wait until the people were stirring, and the gates opened. This happened to be a market day at Segu, and the roads were everywhere filed with people carrying different articles to sell. We passed four large villages, and at eight o'clock saw the smoke over Segu. As we approached the town I was fortunate enough to overtake the fugitive Kaartans, to whose kindness I had been so much indebted in my journey through Bambara. They readily agreed to introduce me to the king; and we rode together through some marshy ground, where, as I was anxiously looking around for the river, one of them called out, "geo affilli" (see the water), and, looking forwards, I saw with infinite pleasure the great object of my mission, the long-sought-for majestic Niger, glittering in the morning sun, as broad as the Thames at Westminster, and flowing slowly to the eastward. I hastened to the brink, and having drank the water, lifted up my fervent thanks in prayer to the great Ruler of all things for having thus far crowned my endeavours with success.

The circumstance of the Niger flowing towards the east and its collateral points did not, however, excite my surprise; for although I had left Europe in great hesitation on this subject, and rather believed that it ran in the contrary direction, I made such frequent inquiries during my progress concerning this river, and received from negroes of different nations such clear and decisive assurances that its general course was towards the rising sun, as scarce left any doubt in my mind.

MUNGO PARK.—*Travels in the Interior of Africa.* A. and C. Black

The Source of the Niger

In spite of the failure of our guides, we had not much difficulty in finding the source. On reaching the valley of the stream we turned along it in a southerly direction till we had got round the head and then descended the ravine. The difference between the ground which forms the river valley itself and the country outside the valley, which includes the Niger basin, is very marked here, as always in this West African country. The part outside of the actual valley is covered with cane brake 10 feet high, yellow and burnt up. The moment the valley is reached the bush is green, the foliage abundant, and the trees are covered with creepers and trailers, which make formidable obstacles. The slopes of the Tembiko ravine are steep and slippery, and, as in most valleys of the district, the bush is so dense that sun, air, and light are excluded. It is easy to imagine that the immense quantity of decaying vegetation will not, under these circumstances, contribute to the healthiness of the country. We descended the side of the ravine, cutting our way through bush and creepers, and, reaching the bottom, found a tiny stream issuing from a moss-covered rock.

Our camp was fixed on the ground bordering the ravine, and nearly due west of the source. We found the height of our camp to be 2800 feet above sea-level.

We were disappointed not to find the elevation of the Niger sources greater. But in spite of the elevations not being very great, the country about the Niger sources is distinctly mountainous. Viewing it from any of the elevations, one sees mountains in every direction. Towards the south, at distances of from 4 to 12 miles, are a number of peaks, one of which is Mount Daro. On the north the high columnar-shaped Kola peak (Mount Kolate) is very conspicuous, whilst in the immediate neighbourhood are Mount Konkonante (literally, the four heads), the Sulu Mountains, two conical and very conspicuous peaks, and Mount Kenna. The highest elevation we recorded, which was on the watershed near Tembi Kunda, was 3379 feet, and I should judge that none of the summits exceeded 5000 feet above the sea. Tembi Kunda is the birthplace of three great rivers. Within a very few yards of the Niger source the Mantile, which runs southwards, the course of which has not yet been explored, rises; and about half a mile to the west is the source of the Bagwe, which runs through British territory.

COL. J. K. TROTTER.—*Geographical Journal*, Sept. 1897.

By permission of Col. J. K. Trotter and of the Royal Geographical Society.

The Central Sudan and the Hausa States

The word "Sudan," which means simply the black country, *i.e.* the country of the blacks, is applied by the natives themselves to the whole of the vast region south of the Great Sahara and north of the equator, stretching from the river Nile on the east to the Atlantic Ocean on the west. To the Hausa States, which occupy about the middle of this immense area, may be most correctly referred the title Central Sudan. The Hausa States extend, roughly speaking, from latitude 8° to 14° N., and from longitude 4° to 11° E. They include an area of about half a million square miles. The reason why this region, the most populous and fertile region in all Central Africa, has been

so long, comparatively speaking, neglected, is that it is shut off from intercourse with the sea, and thus with Europeans, by two obstacles of more than ordinary magnitude. Of the two possible ways by which this territory can be approached, the shortest and most obvious is to ascend the Niger for about 300 miles, and thence proceed overland; the distance to Kano, the most important town in the Hausa States, being about 400 miles from the river. The great drawback to this route is the extreme unhealthiness of the Niger delta, and the difficulty of obtaining any satisfactory transport through it. Moreover, it is only within the lifetime of men still living that this route has been rendered possible at all, by the discovery of the mouth of the Niger.

The other possible way in which Hausaland may be reached from the sea is by crossing the Great Sahara from the Mediterranean, the distance to Kano by this route being about 1800 miles, a considerable portion of which is across an almost waterless desert.

The Hausa-speaking population has been estimated by travellers at about 15,000,000, and though such an estimate must necessarily be extremely rough, we saw no reason for suggesting any great change by way either of addition or subtraction. Every day, as a rule, we passed two or more villages of considerable size, and about every 50 miles we came across a town containing from 10,000 to 30,000 inhabitants. The political capital of the whole country is Sokoto, situated in the north-western corner of Hausaland, a large portion of the inhabitants of which are not Hausas but Fulahs. The commercial capital, and by far the most important town, is Kano.

CANON C. H. ROBINSON.—*Geographical Journal*, September 1896.

By permission of Canon Robinson and of the Royal Geographical Society.

The Hausas

The Hausa native is perfectly black, but he does not possess such thick lips or such curly hair as we are accustomed to associate with the ordinary negro. He is naturally a trader rather than a soldier, but when trained, as he frequently has been down on the coast, by English officers, he is more than a match for any other native. It is hard for any one who has not actually seen Hausa porters to believe the weights which they are accustomed to carry. If you ask a Hausa why his people are so strong, he will tell you that it is because of the different food which he eats. The tribes in the Niger delta, and near the sea-coast, live for the most part on yams and bananas, which are produced with the minimum amount of labour. The Hausas live almost entirely on Guinea corn. Guinea corn is a species of millet, and has a very minute and hard, red grain. This is ground up by the natives, and, mixed with water, makes a sort of porridge, which has, however, a most disagreeable, sour taste.

CANON C. H. ROBINSON—*Geographical Journal*, September 1896.

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For an account of the agriculture and other occupations of the Hausas, see Mr. WALLACE'S account in the *Geographical Journal*, September 1896, pp. 212-214.

The Fulani

The nomad Fulani, of whom the above or Bororo are the most typical, follow the grass—they may be here to-day and gone to-morrow. During the wet season their tendency is to remain in one locality for several months. Their camps, or rugas as they are called, are of the shelter type—rude beehive huts, with frames of sticks covered over with a rough thatch of dried grass. The cattle are herded at night within a zareba of thorns, to protect them from the attacks of wild animals, against whom the pastoral has to wage constant warfare. They are tied together

in pairs, with their heads facing different ways. This prevents them from wandering about the camp. Slings made of fibre are used to drive off hyenas at night. The cattle graze in the vicinity of the camp until mid-day, small boys seeing they do not wander too far afield. They are then taken off to the bush by the young men, and remain there till evening, being watered wherever water is found. Two men look after a hundred head of cattle. In districts where, in the dry season, the cattle have to be watered from wells, they can hardly be said to be tended, being left to find their own way back to the wells in the evening.

The cattle are milked morning and evening, generally by the men and childless women. There are no milking rites, such as are found among many other African tribes. Calabashes are used for catching the milk.

C. K. MEEK.—*The Northern Tribes of Nigeria*. Oxford University Press, 1925.

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Commercial Centres of the Eastern and Central Sudan

(a) Bida

Bida is a striking place to find in Central Africa, and makes all the more impression on one after one has arrived at it from the delta of the Niger, where the natives are of the lowest order of civilisation, with instincts tending to cannibalism. It is situated on slightly rising ground, and watered by two streams, one of which rises only a short way from the walls; these join in the southern portion of the town, and flow through a beautifully green valley to the east. A strong wall, 10 feet high, made of red clay, and crenellated with ditch in front, extends round the town, broken down in a few places, and from where we first saw it there appeared to be a mass of lofty thatched houses and high walls, forming enclosures, which, inter-

mingled with fine trees, extended to the north as far as the eye could reach. The entrance to the Emir's palace is covered with a dome made of bamboos resting on thick walls, and supported at the bottom by short, carved wooden pillars. Some tame ostriches and a deer were the sole occupants left in the big outer enclosure. Bida is an interesting place, with its schools and institutions, and a great many books and boards with Arabic writing. There are numerous dye-pits in the town, and indigo forms a valuable article of commerce. The people are great workers in leather, and make very good saddles, scabbards, and slippers; they are also workers in glass.

The governor left Bida to meet a large body of traders at the Zongo camp, not far from the walls of the town. A curious assemblage they were, collected from all parts of the Hausa States and the Sokoto empire. Some came from Kano, and others from Kuka on Lake Chad, the inland sea in this western half of Africa, where the valuable blocks of potash are found. There were even traders from Tripoli, on the Mediterranean, distinguishable from the others by their spotless white garments and red fezes; and amongst them stood the inevitable Arab, light coloured and with flowing black beard, the very picture of a slave trader. They were told that they could in future use the shorter route, by Kano, Zaria, and Keffi, to Lokoja, instead of coming to Bida, where they would be able to dispose of their goods on the Niger, and would not be taxed in any way. The importance of this trade question and the opening up of the Niger territories will be understood when it is realised that at present most of the European goods come across the great Sahara into the Hausa States from the north, several thousands of camel loads of goods coming annually into Kano from that direction, besides quantities of salt, which is in great demand, as it is found nowhere in Hausaland. Camels come as far south as Bida.

COL. S. VANDELEUR.—*Geographical Journal*, October 1897.

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(b) The Old Walled City of Kano

The market of Kano is, indeed, the most important in the whole of tropical Africa, and its manufactures are to be met with from the Gulf of Guinea on the south to the Mediterranean on the north, and from the Atlantic on the west to the Nile or even the Red Sea on the east. Any one who will take the trouble to ask for it will find no difficulty in purchasing Kano-made cloth at towns on the coast as widely separated from one another as Alexandria, Tripoli, Tunis, and Lagos. The market-place of Kano is probably the largest in the world. It is the great meeting-place of traders from almost all parts of Africa north of the equator and west of the Nile valley. The Tuareg of the desert comes in touch here with the natives of Adamawa and the south; the Arab merchant meets here with traders from Lake Chad on the one side, and the Niger or even the Atlantic seaboard on the other. Here, too, are to be seen Mussulman pilgrims from far and near, on their way to and from Mekka. The walls of the town, which are kept in very fair repair, are 15 miles in circumference and are entered by thirteen gates. The principal occupation of its inhabitants consists of the weaving of cloth from native-grown cotton, and in manufacturing it into garments of various kinds. Kano clothes far more than half the population of the Central Sudan. The greater part of this cloth is dyed blue, the native indigo, which grows wild all over the country, being used for this purpose. The most important article of commerce in the Kano market, on the supply of which the prosperity of the town to a large degree depends, is the kola-nut.

CANON C. H. ROBINSON.—*Geographical Journal*, September 1896.

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For the kola-nut see p. 80.

(c) Timbuktu

The great feature which distinguishes the market of Timbuktu from that of Kano is the fact that Timbuktu is not at all a manufacturing town, while the emporium of Hausa fully deserves to be classed as such. Almost the whole life of the city is based upon foreign commerce, which, owing to the great northerly bend of the Niger, finds here the most favoured spots for intercourse, while at the same time that splendid river enables the inhabitants to supply all their wants from without; for native corn is not raised here in sufficient quantities to feed even a very small proportion of the population, and almost all the victuals are imported by water-carriage from Sansandig and the neighbourhood.

The only manufactures carried on in the city, as far as fell under my observation, are confined to the art of the blacksmith, and to a little leather work. Some of these articles, such as provision or luggage bags, cushions, small leather pouches for tobacco, and gum cloths, especially the leather bags, are very neat, but even these are mostly manufactured by the Tuareg, and especially the females, so that the industry of the city is hardly of any account.

It was formerly supposed that Timbuktu was distinguished on account of its weaving, and that the export of dyed shirts from hence was considerable; but I have already had an opportunity of showing that this was entirely a mistake, almost the whole clothing of the natives themselves, especially that of the wealthier classes, being imported either from Kano or from Sansandig, besides the calico imported from England. The export of the produce of Kano, especially by way of Arawan, extends to the very border of the Atlantic, where it comes in contact with the considerable import of Malabar cloth by way of St. Louis, on the Senegal, while the dyed shirts from Sansandig, which, as far as I had an opportunity of observing, seem to be made of foreign or English calico, and not of native cotton, do not appear to be exported to a

greater distance. These shirts are generally distinguished by their rich ornament of coloured silk, and look very pretty; and I am sorry that I was obliged to give away, as a present, a specimen which I intended to bring home with me. The people of Timbuktu are very experienced in the art of adorning their clothing with a fine stitching of silk, but this is done on a very small scale, and even these shirts are only used at home.

There is, however, a very considerable degree of industry exercised by the natives of some of the neighbouring districts, who produce very excellent woollen blankets and carpets of various colours, which form a most extensive article of consumption with the natives.

The foreign commerce has especially three great high-roads—that along the river from the south-west (for lower down the river there is at present scarcely any commerce at all), which comprises the trade proceeding from various points; and two roads from the north—that from Marocco on the one hand, and that from Ghadames on the other. In all this commerce, gold forms the chief staple, although the whole amount of the precious metal exported from this city appears to be exceedingly small, if compared with a European standard.

The next article that forms one of the chief staples in Timbuktu, and in some respects even more so than gold, is salt, which, together with gold, formed articles of exchange all along the Niger country from the most ancient times. The trade in salt, on a large scale, as far as regards Timbuktu, is entirely carried on by means of the turkedi, or the cloth for female apparel, manufactured in Kano.

The guro or kola-nut, which constitutes one of the great luxuries of Negroland, is also a most important article of trade. Possessing this, the natives do not feel the want of coffee, which they might so easily cultivate to any extent, the coffee plant seeming to be indigenous in many parts of Negroland.

The chief produce brought to the market of Timbuktu consists of rice and negro corn, but I am quite unable

to state the quantities imported. Besides these articles, one of the chief products is vegetable butter, which, besides being employed for lighting the dwellings, is used most extensively in cookery as a substitute for animal butter, at least by the poorer class of the inhabitants. Smaller articles, such as pepper, ginger, which is consumed in very great quantities, and sundry other articles, are imported. A small quantity of cotton is also brought into the market.

H. BARTH.—*Travels from Timbuktu and the Sudan*. Ward, Lock, and Co. Ltd.

For the most recent account of Timbuktu, see F. DUBOIS, *Timbuktu the Mysterious* (Heinemann), chapters x.-xii., and for its commercial importance, *ibid.*, pp. 250-274.

Lake Chad

It was near the village of Arege that I had my first view of Lake Chad. At this point the lake was fringed with reeds, but openings permitted a clear view of the open water gleaming in the sunlight, and enlivened by a large number of birds. Above high-water mark the ground was cultivated with cotton, a little of which is generally seen in similar situations. Farther south the road skirts the edge of the open water with no reed-barrier, and we observed a considerable swell, which indicated a certain depth. The water is fresh and good to drink, and enlivened by a large number of birds. Above high-water mark, round the whole north-west and north of Lake Chad, there is a continuous chain of gently sloping sand-hills covered with bush, and forming the virtual shores of the lake. The ground is everywhere strewn with the remains of huge fish, and the whitened bones of hippopotami, crocodiles, and elephants. Game simply swarms, and on one occasion the troops of antelopes occupied more than ten minutes in galloping past our encampment. Giraffes, lions, and rhinoceros are also abundant. On the west side we had seen some canoes of the Chad islanders, the Buduma.

These canoes are made of bundles of reeds tied closely together, and, though heavy, are unsinkable, albeit the crew are practically seated in the water. The form is that of an ordinary undecked boat, with an elevated prow. The Buduma are thorough-going banditti.

M. F. FOUREAU.—*Geographical Journal*, February 1901.

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The Ascent of Cameroons Peak¹

For a little way after leaving the native village we traversed plantations of bananas and edible arums, then we plunged into the dark forest. The faintly-indicated track ran chiefly along ridges of rock, with a ravine on either side, and often we had to walk for yards along the slippery trunks of fallen trees, these sometimes bridging abysses of vegetation where, in the case of a fall, one might sink far out of sight before reaching firm ground.

The wild flowers were beautiful almost beyond description, especially the orchids, which were displayed with a variety and profuseness rare to Africa, where this strange and lovely group is but poorly represented as a rule. There was one species with large heads of mauve purple-centred flowers. It grew in the forest glades with a luxuriance rivalling the wild hyacinths in English woods, and through all the vistas one caught the stream of tender mauve, peach-like colour meandering beneath the soft green verdure of the ferns and lycopodiums. Another orchid grew in masses on the sodden tree-trunks, and its sprays of flowers were white and orange. There were other orchids—white, white and green, purple, and flesh-colour—new to me and nameless. For the space of our ascent, between four and five thousand feet altitude, we were certainly in orchid-land.

When the show of orchids lessened, the tree-ferns

¹ The name *Cameroons* is an English corruption of the Portuguese word *Camaroes*, shrimps or prawns, and was applied to the estuary on account of the abundance of these little crustaceans.

appeared on the scene and added another element of beauty to the exquisite glimpses of forest-glades which every turn and twist of the path revealed. In one place we passed for a hundred yards through a natural avenue of tree-ferns. Other ferns, though not arboreal, attained a considerable height above the ground owing to the immense size of their fronds, some of them being six feet in length. The trunks of nearly all the trees were thickly clothed with a rich mantle of ferns, often resembling a drapery of green lace. The ground was covered with a dense carpet of delicate lycopodium and orange-tinted moss, from which spongy surface little scarlet fungi gleamed in sheltered places. The prevailing flowers were white, cream-coloured, and pink balsams, blush-tinted, yellow-centred begonias, and mauve and white labiates; also a strange-looking liliaceous plant, with red, wax-like, tubular blossoms, seemingly allied to the well-known "Golden Rod" of our gardens.

Hereabout the forest scenery had reached the climax of its beauty. Handsome turacos hopped and flitted among the foliage of the loftiest and most umbrageous trees, feeding in a desultory manner on the ripened fruits. The particular species found in these forests is coloured thus: Body—grass-green; beak—yellow; ridge of headcrest—crimson; wings—purple, with scarlet pinions; and the long tail a deep rich blue. It thus presented an epitome of the prevailing colours of the forest scenery—the tender green of the foliage, the purple-blue shadows of the forest depths, and the yellow and red of the young leaf-shoots and the blossoming trees.

Above 5000 feet the temperature was sensibly lower, and we found ourselves in heavy mists. As we continued to ascend, the forest trees exhibited increasing quantities of orchilla lichen ("old man's beard") hanging in frosty-looking festoons from their trunks and branches; and brambles, nettles, clematis, geraniums, forget-me-nots, and other plants of the temperate zones, made their appearance.

At about 7000 feet altitude we emerged from the forest on to the rolling grassy downs, dotted here and there

with patches of woodland, and occasionally sprinkled with huge isolated boulders of rock, or furrowed with the half-concealed corrugations of a lava flow. Here forms of life entirely strange to the tropical fauna and flora of the lower country made their appearance. Stone-chats, wheatears, larks, and buntings flitted, chirped, and sang about the lichen-covered rocks and the stretches of fragrant heather. Clove, dandelions, sow-thistles, campanulas, and hemlocks grew amid the wiry grass at the path's side. Against the sky-line rose the bold outlines of the broken-down craters; while the billowy sea of undulating forest land lying on the upper slopes of the mountain side was partially concealed and severed from our surrounding scenery by the long wreaths of white mist, which were really lazy clouds reposing on the tree-tops.

After some seven hours' walking from Mapanja, we left the open grass country, and entered a dense and somewhat majestic forest, which was an outlying tongue of the woods below, that, owing to favourable conditions of soil, had penetrated higher up the mountain side. Soon after penetrating this woodland we heard the trickle of running water, and, farther on, the path was crossed by a tiny stream. Then, in a cleared space under trees of great girth and spreading branches, we saw a small tumbled-down shanty, the last remains of the former encampment of some Swedish travellers [Mann's Spring].

When we had sufficiently explored the vicinity of "Mann's Spring," we began to move nearer towards our goal, the culminating peak of the ridge, and for this purpose transferred our camp to a place known as "Hunter's Hut." This was a small shanty of sticks and grass, a night shelter for the native hunters who crossed the mountains on trading excursions, or for an antelope hunt. The walk to Hunter's Hut was of a most interesting character, and the general aspect of the scenery called to mind the Scottish hills rather than African volcanoes. The fresh, crisp air, the misty sunshine, the grassy downs, the heather-clad hills, were strangely like the Highlands.

Yet when one looked downwards towards the south, there was Equatorial Africa spread in a living map at one's feet.

Hunter's Hut, our new encampment, was situated at some 8300 feet in altitude, in a narrow peninsula of forest pushed up the mountain side. A nearly dry ravine ran through the little settlement, half choked up with ferns and creepers. Some rain-water, collected in pools amid the stones, supplied us with that necessary element. This great ditch was crossed in several places by natural bridges of fallen trees, some of them beautifully fringed with ferns and violets.

Having well provisioned my settlement, I began to make a start for the ascent of the high peak, the loftiest summit of the chain. We left Hunter's Hut at eight in the morning, and reached my intended camping-place (at an altitude of 10,500 feet) by eleven. During the whole climb (which was very arduous, as we had to cross some fields of lava and scorïæ) it rained incessantly. By noon the sun had dissipated all the clouds and shone out warmly. Then, in a moment, as if some giant's hand had rent the veil cloud asunder, the mighty peak I was desirous to ascend appeared before me with startling nearness and distinctness. I never encountered any mountain yet which could vie with the High Peak of the Cameroons, in unusual beauty of local colouring. Beginning with the central and highest peak of the triple crater, its left-hand slope at the top of the ridge had a strip of vivid Indian red, formed, in reality, by a layer of brick-red clinkers; then below this came a band of bright yellow moss; this was succeeded by a large, irregular piece of purplish mauve—fine cinders—quite uniform in tint. On the right-hand side of the middle crater, the prevailing colour was greenish grey grass, dotted here and there with patches of gold and purple. The actual peak of the summit was purplish red, with a very thin gold edge. The lower portions of the middle crater near its base were bright green, streaked with greenish grey where the long grass or the *genista* bushes predominated over the tender herbage. The crust of the crater lying to the

right of the loftier central peak was a greenish grey in colour, streaked with red, while the crater rising on the left hand was purplish black in its peaks and upper rim, and a clear slaty-blue round its base, with a few green streaks down its furrowed sides. The minor subsidiary craters, lying apart from the main peak, were uniformly clad in brownish green, and therefore offered a complete contrast to the vivid tints of the triple-crowned summit.

With the grand peak rising before me, brightly coloured by the afternoon sun, I hurried on towards my goal, traversing a series of grassy undulations with ease, but soon hindered in my progress by having to cross a wide extent of grey scoriæ. When I had scrambled over the narrowest portion of the cinder-beds, I found myself walking the sides or round the base of a large group of craters, and my progress was even more impeded than it had been among the loose scoriæ, for I had to wade through a dense mass of closely-growing clumps of bushy tussocky grass, which completely concealed the soil, and was at least two feet in depth.

At last I struggled out of the rank herbage on to a clear ridge, on which large shrubs of genista and an arboreal heath were growing. Here the ground was covered with the finest black cinders, looking just like coal-dust, but for their bluer colour and larger particles. Here the walking was pleasant and firm. I was now at the actual base of the High Peak.

From the summit I had a view which, in magnificence and extent, can hardly be paralleled in the world. The sun was just setting, and his rays bathed all the vast expanse of earth, sea, and sky in a tender rosy mist, while the mossy slopes of the mountain side were turned to a refulgent gold.

SIR H. H. JOHNSTON.—*Scottish Geographical Magazine*, Oct. 1888.

By permission of Sir H. H. Johnston and of the Royal Scottish Geographical Society.

This article is condensed from a longer description. It is an excellent illustration of the succession of zones of vegetation on a lofty mountain.

IV.—KENYA COLONY AND PROTECTORATE AND THE GREAT LAKES OF THE NILE BASIN

Across British Somaliland

BERBERA was selected as our starting-point. Berbera town consists of two portions about a mile apart. It is situated upon the coast, and built upon the low-lying coral-sand desert which fringes the coast everywhere here, and which has evidently comparatively recently risen above the sea-level. A spit of sand juts out into the sea and encloses a shallow bay, which forms a fairly good harbour.

Our way at first led over the belt of stony, sandy desert which fringes the coast for some ten or twelve miles inland—our course was S.-W. Not a blade of grass or bush was to be seen while going over this, but, when these ten or twelve miles were traversed, stunted mimosa and other thorny shrubs began to appear, and gradually became numerous; odd tufts of grass could be seen; antelopes bounded off out of the way and out of gunshot. Ground squirrels, gerboas, and hyraxes were caught sight of, and the birds were represented by the sand-coloured desert lark and odd vultures. The jackal, so hated by the Somalis, was also seen sneaking away under the bushes.

All this time the ground was rising, though imperceptibly, and before the second day was over we got into more rocky, stony country, the rocks being composed of handsome salmon-coloured and other granites, syenites, quartzites, and schists. Here the vegetation became more varied; more bushes and odd trees, all of thorny varieties

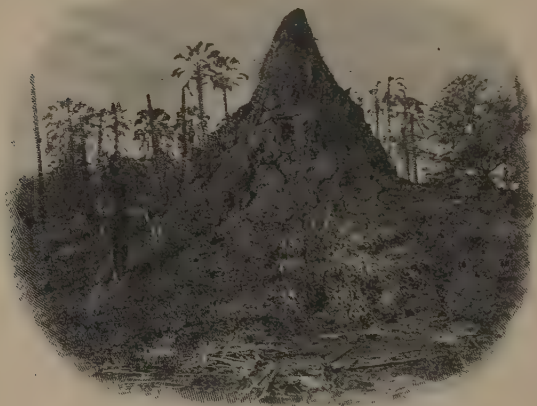
of acacias, cacti with peculiar sooty, ball-like flowers of cricket-ball size, varieties of aloes, and other kinds of plants, gradually became more numerous; and with the vegetation more birds, such as wheatears, weaver-birds, and others. Dry beds of watercourses had to be crossed, and the ground alternated with rocks and loose, sharp cornered gravel very frequently.

Every now and then we would meet native caravans with camels laden with the household utensils and the huts of the men, women, and children, who were on their way to the coast for the rice and dates which hold so large a place in their daily regimen. Cows, sheep, and goats were being driven along with them, and were to be disposed of for the purpose of obtaining the necessary money for the purchases they wished to effect.

On the way we camped at Hamas, a place at the base of some flat, basalt-topped hills. During the day we passed a place called Addi Adeya. For Somaliland this is a place for luxuriance of vegetation; trees of more variety, including palms, were scattered about the banks of the dry river-beds, in the sand of which, by digging holes, water could be obtained. There was much grass in patches under the bushes and trees. This, together with the bushes themselves, gave pasture to the large flocks of sheep and goats, which, with their attendants, and with some cattle and camels, were covering the ground. This place, having so much pasture, is often resorted to by these wandering people, and has suggested its name, Addi Adeya, which means "white with flocks." Here we had already arrived at the elevation of 2700 feet above sea-level, and the nights were comparatively cool.

When we got as far as Gelele, we caught sight of the Nasha Habala hills. These are a landmark, for they can be seen for a great distance all round, and are near Hargaisa. The country about here is very much sprinkled with the extraordinary obelisk-like white-ant or termite heaps. These take all sorts of fantastic shapes, but here they always have a columnar shape, which is quite

different to that seen some three weeks later near the Hawash River in Abyssinia, yet in similar country. They assume that shape because the termites attack the trunks of trees in order to devour the wood. They do this by enveloping the trunk of the tree in a clay mass to a considerable height. In the course of time the tree is killed and devoured—in fact disappears, but the columnar ant-heap remains. In the Hawash valley the heaps take



AN ANT-HILL.

more the shape of steep-sided mounds, of from three to five feet high. This shape appears to come about because the ants there attack a bush which they gradually envelop with clay in a similar manner.

Hargaisa, a more populous part of the country, is a more or less level plain, which appears to have been a large lake in times gone by. This lake has been silted up in the course of time. It is entirely composed of alluvium, to what depth it would be difficult to say; but that it is considerable is seen in the sections which the torrential rains have cut through it, in the form of deep, steep-sided water-courses and river beds. These are sometimes from 30 to

50 feet in depth, and for the most part have perpendicularly precipitous sides. From Hargaisa we crossed the Meran prairie, sometimes called the Bund, to Jigjiga. The prairie is an almost level stretch of treeless coarse grass-land, 5370 feet above the sea, and very different to the country we had come through since leaving Hargaisa. This had been arid and stony; the ground was covered with sandy soil and thorny acacias, cedars, and other trees, with aloes; many other plants and grass clothed the surface and formed a more or less continuous open bush. Jigjiga is a station upon a small river which forms the boundary line between British and Abyssinian territory.

DR. R. KOETTLITZ.—*Journal of the Manchester Geographical Society*, 1900.

By permission of the Manchester Geographical Society.

The Galla Country

The country of the Gallas we had gone through so far was very thinly populated, though from the number of deserted villages we had passed there must formerly have been many inhabitants. Until you get well up into the mountainous region it is dry like Somaliland, and suitable only for grazing purposes. Towards the north it appeared to consist of a series of high plateaus and mountain peaks, rising one above the other, while to the south a great extent of low-lying bushy country, containing only a few isolated, outstanding eminences, rising to varying heights of from 1000 to 3000 feet, spread out far below.

Our next march took us through a very different sort of country from that to which we had been accustomed. Here and there would be open plains covered with fine green grass up to one's knee, and dotted with trees resembling our apple-trees. But we experienced the greatest change when we descended into a broad and lovely valley, and camped by some springs of good, clear water, called Gorgora. Here the vegetation was most luxurious

and the variety of trees and shrubs infinite. What a delightful transformation in nature it was for us. The light, beautiful green of the foliage, and the balmy and moist atmosphere reminded me forcibly of spring-time in my own country, only the variety of the flora and fauna was distinctly African. Giant sycamores, pine-trees, and euphorbias spread out their limbs over veritable flower-beds. Fuchsias, sweet-peas, and countless other plants seemed to be trying to crush each other out. Gaily-plumaged birds sang lustily or flitted hither and thither, seeking to devour some passing butterfly. All about were fresh elephant-tracks, as well as the spoor of a few lions and hyenas.

DR. A. DONALDSON SMITH.—*Through Unknown African Countries*.
E. Arnold.

By permission of Mr. Edward Arnold.

See also DR. A. DONALDSON SMITH.—“Expedition through Somaliland.” *Geographical Journal*, August 1896.

The Somalis

The political institutions of the Somalis are few and simple. The Koran is their law, civil and commercial, and regulates their social relations. Each tribe is independent of the others. A few of the larger tribes have sultans; the smaller tribes and subdivisions have each their *ugaz*, or *agal*—that is, headman. The affairs of the tribe and the orbit of its circulation are arranged, by general debate and agreement, by all the men of the tribe. Their social life and economy is equally simple. During the intervals of peace the pasturing of the camels and flocks is their sole occupation. Save the duty of protecting these from looting, the chief work falls upon the women and children, whilst the men sit under the trees, with only one subject for thought, conversation and song—that of looting, and their own exploits, retrospective and prospective. The *karia*, or Somali village, is as easily moved as a camp of tents.

Their huts—*gurgi*—are simply bent boughs covered with skins and mats. The mats are made of grass and bark, and form the covering or saddle of the baggage camels when loaded. All that pertains to the making, removal, or putting up of the *gurgi* is the care of the women. You may often see them standing under the trees, with a long strip of bark going in at one corner of the mouth to be chewed, and coming out at the other in fibre ready for plaiting. When a site for the *karia* is selected the women place the huts in a semicircle, whilst the men cut the thorn for the *zeriba*. The inner circle of the *zeriba* is made into pens with thorn fences for the live stock. The food of the Somalis is meat alone, almost always mutton and goat. On great occasions they indulge in camel. Their drink is milk, usually camels', occasionally cows', though they never eat beef. Milk is often the sole diet of a Somali for months together.

A. E. PEASE.—*Scottish Geographical Magazine*, Feb. 1898.

By permission of A. E. Pease, Esq., and of the Royal Scottish Geographical Society.

The Gallas of Kenya Colony

All tribes of this part of Africa may be divided into two classes, pastoral and agricultural. Pastoral tribes, from the fact of their having to follow the pasture necessary to graze their flocks, are more or less nomadic. Agricultural tribes, on the other hand, always inhabit a fixed location. Pastoral tribes, whenever they become degenerate, or in any way worsted in the struggle for existence, take upon themselves the habits of an agricultural tribe; the converse is never the case. The Wapokomo are essentially an agricultural tribe. They inhabit the river on both sides, and are never found living far away from the immediate vicinity of its banks. They belong to the Bantu race. Living on the river for generations, the people have made it their highroad, all their

internal communication being carried on by means of canoes. Nearly every family in every village possesses one or more canoes. These canoes, which are often 30 or 40 feet in length, and seldom more than 2 feet in width, are very skilfully made, being hollowed out of the solid trunk of a tree by means of very primitive tools.

The Tana Gallas are an example of a pastoral tribe, worsted in their struggles with their enemies, abandoning pastoral nomadic life, and taking up quieter agricultural



NATIVE DOGS OF CENTRAL AFRICA.

pursuits. They are a branch of the great Galla tribes situated in the south of Abyssinia. The male members of the tribe on their decease are buried close to the cattle sheds; this is a relic of their old pastoral days, their love of cattle being still intense. The Korokoro Gallas will often travel away to the mouth of the Tana to buy cattle, and should they survive the risks of the journey the cattle are usually carried off by the Somalis before many months have elapsed. Many of the Gallas are capital hunters, and at the proper seasons they will go right out into the steppe land and camp at a couple of days' distance from the river, obtaining water by digging in the sand of a dry torrent bed. They have at these camps a large breed of roughly

trained dogs, which they use to bring an animal to bay, thus enabling the hunter to run in and spear it. They are very successful in obtaining giraffes by this method.

C. W. HOBLEY.—*Geographical Journal*, August 1894.

By permission of the Royal Geographical Society.

See also KOETTLITZ.—“A Journey through Abyssinia to the Nile,” *Geographical Journal*, March 1900; and “Journey through Somaliland,” *Scottish Geographical Magazine*, August 1900.

Configuration of Kenya Colony and Protectorate¹

The land rises continuously in elevation almost from the sea-shore. Crossing a small range of hills, some 15 miles inland, we enter a country which we will call the second zone. The soil is fairly good, but arid and parched, for there is little herbage to retain moisture, and very few streams. It is at present unfertile, covered with scrub, and badly watered. Some hundred miles or so from the coast we come on to the Highlands which form the bulk of British East Africa. There is a rapid rise to 5000 feet; the greater part of Kikuyu is 7500, and at the Mau escarpment reaches a height of 8000 to 10,000 feet.² This lofty plateau extends from Lake Baringo to the borders of the German sphere. Beyond this (the Mau or Naudi) plateau, proceeding still inland, there is a sudden drop to the Central Lake District. All this lake country maintains an average height of some 4000 feet. The deepest rift which extends through the heart of the continent is on the further side—west—of the Lake District. Beginning with Lake Nyasa (only 1700 feet), it is interrupted by a plateau of some 150 miles, and then extends along Tanganyika. Again the rift is broken north of Tanganyika, but is resumed in the Semliki valley, the Albert Lake (2000 feet), and then stretches away uninterruptedly along the Nile valley to Egypt. Thus British East Africa is a high formation falling away to the German sphere to the south,

¹ Formerly called British East Africa.

² The Mau escarpment forms the western side of the eastern rift in which lie Lakes Naivasha, Baringo, Rudolf.

and towards the great chasm on the west. Similarly it falls away to the north towards Lake Rudolf and the Nile valley. This great altitude makes the country between the coast and Lake Victoria the most fertile I have seen anywhere in Africa.

SIR F. LUGARD.—*Geographical Journal*, December 1894.

By permission of the Royal Geographical Society.

For a proper understanding of the Physical Geography of British East Africa, PROFESSOR GREGORY's articles in the *Geographical Journal*, October, November, December, 1894, are essential.

The Waterways of Central Africa

There exists in the centre of the continent a wonderful system of great waterways: the Victoria Lake, with a coast-line of close on 1000 miles; the Albert Edward and Albert Lakes, with over 200 miles each; and the Nile, navigable from Lake Albert (with one interruption—at Dufilé) as far as Gondokoro, some 200 miles from the exit of the river at the Lake. We thus have a total coast-line and river waterway of some 1600 miles from point to point, and vastly greater when the indentures of the lake coast-line and the windings of the river are added. In addition there extends the waterway of the Nile, navigable without a break to Khartum, 1080 miles, and thence to Cairo (with many cataracts), 1500 miles farther. To the south of the Victoria lies the Tanganyika, 400 miles long, and south of it Nyasa extends to the Shiré and Zambezi. To the north-east, within British East Africa, lies the great Lake Rudolf. This territory, therefore, cannot be said to be destitute of water communication. On the contrary, it is singularly fortunate in this respect, but its sole disadvantage lies in the fact that these waterways have no practicable outlet to the sea.

SIR F. LUGARD.—*Our East African Empire*. W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

Distribution of Plant Life in East Africa

The dependence of animal distribution on that of plants, and of the latter on the water supply, is well shown in East Equatorial Africa. On the mountains there is an abundant rainfall, so that they support a luxuriant forest and jungle. Near the coast and beside the rivers, the air is very moist, so that the dew is very heavy, and supports a prolific vegetation. But on the high plateaus that cover the largest parts of this region the air is dry and the rains concentrated into two rainy seasons; the plant life on these is therefore dependent on the capacity of the soil to retain moisture. Geologically the region consists of a vast undulating upland of gneiss, covered in places by wide sheets of volcanic rocks; according to which of the two rocks crops out at the surface, there are one of the two types of vegetation. The volcanic rocks form very rich soil, and they absorb moisture very readily, and give it up slowly. The result is that all of these lava tracks are clad in a rich green turf, and have numerous springs; they form the various "rangatan" or high-level pasture lands. The gneiss, on the other hand, is very porous, and as the foliation is vertical, all the water that falls on it rapidly percolates to a depth at which it has no influence on the vegetation. The tracts formed by this rock are therefore barren, sandy plains, supporting only irregular tufts of dry grasses, and scrub with narrow or spiny leaves, or trees with succulent stems or leaves, such as candelabra-like euphorbias, aloes, etc. The water supply is the factor that appears at first sight to override all others, but a certain zonal arrangement according to height is also well marked. The vegetation is distributed in eight zones. (1) The coast zone, characterised by groves of coco-nut palms, mangoes, etc., which is continued inland for some distance along the larger rivers. (2) The barra, characterised by mimosa scrub, and huge cactus-like euphorbias, aloes and *Sanseivera*, and in the rainy season by masses of white convolvulus.

(3) The woods of the upland plateaus, which occur in the areas with a heavy rainfall. (4) The lower forest zone occurs in regions of heavy precipitation around the bases of the higher mountains, such as Settima, Kenya, and Kilimanjaro. (5) The bamboo zone, which occurs between the levels of 8000 and 9800 feet. (6-7) The upper and lower Alpine zones, with tree groundsels, lobelias, and tree heaths, meadow orchids, and gladiolus. (8) Above the snow-line a few dwarf hemichrysum and lichens are the only representatives of vegetable life.

PROF. J. W. GREGORY.—*Geographical Journal*, December 1894.

By permission of the writer and the Royal Geographical Society.

For a description of these zones of vegetation on Mount Kenya, see H. J. MACKINDER, "Journey to the Summit of Mount Kenya," *Geographical Journal*, May 1900.

Mombasa

Our natural starting-point for British East Africa¹ is the small island of Mombasa, which is at the mouth of the bay and divides it into creeks, one of which runs inland to the foot of the Rabai hills, and forms two natural harbours, the one to the north being most used as the approach to the old, and at present, most important town of Mombasa, though the southern one has the best entrance and can accommodate comfortably a squadron of ten ships. The island itself has hitherto been of small importance, possessing until quite recently the one town, Mombasa, with its old Portuguese fort and narrow streets of Arab houses, the chief features of which are the innumerable staircases, windows, and smells. The rest of the island was overgrown with trees and brushwood, as the native gardens were, and are still, on the mainland. Within the last five years a wonderful change has come over the place owing to the advent of the Uganda Railway. A town called Kilindini has suddenly sprung up on the side of the island west from Mombasa, and between the two lines there is an excellent road and tram lines. The railway crosses to

¹ Now called Kenya Colony.

the mainland at the Makupa ford, and rushes on for the first 250 miles through a country that cannot in any sense be described as affording pleasant prospects to Europeans.

J. B. PURVIS.—*Handbook to British East Africa and Uganda*.
Sonnenschein.

By permission of Messrs. Swan Sonnenschein and Co.

The City of Zanzibar

Zanzibar is one of the cleanest and most inoffensive cities in the world, and yet has retained many of those features which make an Eastern town so fascinating. The town is a maze of tortuous narrow streets, so narrow, many of them, that no sort of wheeled vehicle can pass through them.

It is a city of brilliant sunshine and purple shadows; of dark entries and latticed windows; of mysterious stairways, and massive doors in grey walls which conceal one does not know what; of sun-streaked courtyards and glimpses of green gardens; of barred windows and ruined walls on which peacocks preen. It is a town of rich merchants and busy streets; of thronged market-places and clustered mansions.

Over all there is the din of barter, of shouts from the harbour, the glamour of the sun, the magic of the sea, and the rich savour of Eastern spice.

MAJOR F. B. PEARCE, C.M.G.—*Zanzibar*. T. Fisher Unwin.

By permission of E. Benn, Ltd.

A March to Uganda¹

We started on our long march to Uganda on the 8th, along a narrow, well-beaten track. It was now the middle of the dry season, and the great difficulty during the first few days' march was with regard to water. There was nearly a full moon, so we were fortunately able to march at night, and crossed the Taru desert (54 miles) in two and a half days, carrying water with us. We reached our first important point, Machako's, on 5th October. We had

¹ Much condensed.

already risen 5400 feet since leaving the coast, and were now in the highlands of East Africa, where the days were often cool and cloudy, and it was a pleasure to live. We stayed five days at Machako's, and then continued our march to Kikuyu across the Athi plains, a great sea of gentle grass-covered undulations, intersected by water-courses, and in places teeming with game—a perfect sportsman's paradise. Making our way through what is known as the meridional trough or rift, bounded by high ridges on each side—we reached the Eldoma ravine on 27th October, and the next day commenced the ascent of the Mau escarpment. The crossing of the Eldoma ravine took a long time, as, after the first few men had passed, the path down to the stream became frightfully slippery owing to the mud, and porters and loads frequently tumbled down the steep slope. The track beyond, through the Subugo forest, had become a sort of torrent in places, and it was with a sense of relief that we emerged from the blackness of the forest and the sea of mud underfoot to find ourselves on the top of the mountains at a height of 8700 feet above the sea. This may be said to be a part of the main watershed of Africa, as, after leaving the Mau escarpment, all the rivers and streams flow into the Victoria Nyanza, thus helping to form the source of the Nile. A great charm of the march to Uganda is the variety and utter dissimilarity of the country through which one passes. Here, at the top of the escarpment, the ground was not as flat as one would imagine, but the path led over one hill after another, covered with long grass, and studded with bamboo thickets, the home of a few buffalo which have survived the rinderpest, and whose tracks can sometimes be seen. We saw the Victoria Nyanza for the first time on 15th November, the day we crossed the Sio River. From here we marched a distance of 12 miles to an old market-place, a sudden transition from Kavirondo to Usoga occurring during the latter part of the march, which was through banana plantations. The people were all clothed in bark cloth; they were



PANORAMIC VIEW OF ZANZIBAR, SHOWING PALACE, HAREM, GOVERNMENT HOUSE, SIGNAL TOWER, AND CUSTOMS HOUSE.

much more intelligent-looking, and very different from the naked savages of Kavirondo. It was a delightful change to march through Usoga after the barren and deserted country we had passed through on the way to Kavirondo. Sometimes the track led through shady banana plantations, sometimes through woods with lovely trees, and the whole country seemed like a great garden. Instead of crossing the Victoria Nile just above the Ripon Falls we went to Lubwa's, so called after the chief of that name, and thence we crossed to Berkeley Bay. After a stuffy march through woods and banana plantations we reached a line of hills, and after ascending this ridge were well repaid by a most lovely view of the lake, or at least of a large bay of a turquoise colour, studded with little picturesque islets, and reminding one much of the Italian lakes. All our caravans crossed to the Uganda side of the bay, a distance of 7 miles, on Thursday, 20th November, and camped close to the lake. We were taken over by a fleet of the picturesque-looking canoes, with long prows ornamented by antelope horns, which are used by the Wasoga and the Waganda on the Victoria Nyanza, the paddlers making a great noise and singing all the time. Our first impression of travelling in Uganda was that it was like going along a switchback railway with immensely high grass threatening to overwhelm us on each side, and we were at once struck by the luxuriance of the tropical vegetation.

COL. S. VANDELEUR. — *Campaigning on the Upper Nile and Niger.* Methuen.

By permission of Messrs. Methuen.

For an account of the Athi Plains, see C. W. HOBLEY, "People, Places, and Prospects in British East Africa," *Geographical Journal*, August 1894, pp. 117, 118.

Kilimanjaro

Kilimanjaro may be described as a great, irregular, pear-shaped mass, with its major axis in a line running north-west and south-east, the tapering point running into the

heart of the Masai country. On this line it is nearly 60 miles long. Its minor axis, running at right angles, reaches only to some 30 miles. The mountain is divided into the great central mass of Kibo and the lower conical peak of Kimawenzi. Towards the north-west it slopes away into a long ridge, which gradually tapers horizontally and vertically till it becomes merged in the Masai plain.

The southern aspect of this stupendous mountain forms the country of Chaga, which may be described as a great platform, basement, or terrace, from which the dome and peak abruptly rise. This platform may be described as rising from 4000 to 6000 feet, over 10 miles of rounded ridges, and characterised by deep glens at its broadest part. The features of this region, though in themselves rich and pleasing in the extreme, and presenting a smiling aspect with variegated plantations, yet somewhat detract from the imposing grandeur of the mountain, as the eye has to wander at a distance of more than 15 miles before Kibo, at a height of some 12,000 feet, springs precipitously heavenwards.

It is from the north side, however, that the grandest view of the whole mountain can be obtained. Standing a short distance off on the great Njiri plain, we see the entire mountain horizontally and vertically, without moving the head. Rising from the almost level sandy plain at an altitude of about 3000 feet, it springs at an even angle to a sheer height of 15,000 feet, unbroken by a single irregularity or projecting buttress. No cones or hills diversify its surface. Neither gorge nor valley cuts deep into its sides. You see on your left the great cone of Kimawenzi, with only one or two slight indentations, sweeping round in a saddle-shaped depression, to spring up into a dome of the most perfect proportions. The snow face shows here to great advantage, forming a close-fitted glittering helmet artistically laid on the massive head of Kibo.

The only inhabited part is the Chaga platform, which offers favourable conditions for agriculture in the projecting terraces, its rich soil, and the numerous streams

which lend themselves profitably to irrigation (one of the features of the land). It is only, however, the centre and lower slopes that are cultivated, as the climate is too cold and trying for the aborigines above 5000 feet.

JOSEPH THOMSON.—*Through Masai Land.* Low.

By permission of Messrs. Sampson Low and Co.

See also DR. H. MEYER, "Ascent to the Summit of Kilimanjaro," *Proceedings Royal Geographical Society*, June 1890.

Kenya

Kenya rises as a great volcanic cone, nearly 30 miles in diameter at its base, from a thorn-clad plain 5700 feet in altitude. Up to a height of 15,000 feet the angle is very low, and the slope is unbroken comparatively by ridge or glen. From that level the mountain suddenly springs into a sugar-loaf peak—the resemblance to a sugar-loaf being made all the more striking by the glittering facets of snow which characterise the uppermost 3000 feet. The sides of the peak are so steep that the snow cannot lie on many places, the unclad parts showing through the white as black spots. Hence its Masai name of Donyo Egare, the speckled or grey mountain.

JOSEPH THOMSON.—*Proceedings of the Royal Geographical Society*, December 1884.

By permission of the Royal Geographical Society.

For descriptions of Kenya, see PROF. J. W. GREGORY, "Contributions to the Physical Geography of British East Africa," *Geographical Journal*, November 1894, pp. 413-421; and H. J. MACKINDER, "Journey to the Summit of Mount Kenya," *Geographical Journal*, May 1900.

Masai Land

The Masai country is very markedly divided into two quite distinct regions—the southerly, or lower desert area, and the northerly, or plateau region. The southerly is comparatively low in altitude—that is to say, from 3000 to 4000 feet. It is sterile and unproductive in the extreme.

This is owing, not to a barren soil, but to the scantiness of the rainfall, which for about three months in the year barely gives sufficient sustenance to scattered tufts of grass. The acacia and mimosa have almost sole possession of those dreary plains, except near the base of some isolated mountain or other highlands, where small rivulets trickle down, to be speedily absorbed in the arid sand. No river traverses this region, and many parts are covered with incrustations of natron, left by the evaporation of salt-charged springs. It is not, however, to be conceived as a monotonous level. Far from it. The colossal Kilimanjaro and the conical Mount Meru belong to it.

The northerly or higher plateau region of Masai Land may be described as rising from an elevation of nearly 5000 feet on either side, and culminating in the centre at an elevation of little short of 9000 feet. On the eastern half of this divided plateau rises the snow-clad peak of Kenya, and the picturesque range of the Aberdare Mountains, which run almost parallel with the central line of depression. A more charming region is probably not to be found in all Africa, probably not even in Abyssinia. Though lying at a general elevation of 6000 feet, it is not mountainous, but extends out in billowy, swelling reaches, and is characterised by everything that makes a pleasing landscape. Here are dense patches of flowering shrubs; there noble forests. Now you traverse a park-like country enlivened by groups of game; anon great herds of cattle or flocks of sheep and goats are seen wandering knee-deep in the splendid pasture.

There is little in the aspect of the country to suggest the popular idea of the tropics. The eye rests upon coniferous trees, forming pine-like woods, and you can gather sprigs of heath, sweet-scented clover, anemone, and other familiar forms.

JOSEPH THOMSON.—*Through Masai Land.* Low.

By permission of Messrs. Sampson Low and Co.

The Masai

After leaving the second swamp, one day out from Kikuyu forest, we crossed the watershed into the "meridional rift valley," along which lie the lakes Elmentaita, Naivasha, and Nakuro. I was disagreeably surprised to see a large party of Masai passing down the valley just when I was about to descend into it. These were Elmoran on the war-path, probably 500 or 600 warriors, all bachelors, and under thirty years of age. They are tall and well-built, and walk at a tremendous pace, with a curious long, lolloping step, and with the little bells on their legs tinkling as they go. I was at the time a little in front of my men, and brought forward my askari to be ready in case they were disposed to attack, but they took very little notice of us, and when the Lygonani appeared, I had the pleasure of shaking hands with him and some hundred stalwart young fellows who had attempted to heighten the ferocity of their appearance by enclosing their faces in a bush of feathers, often 3 feet across, and plastering their bodies with crimson or white clay. They were probably on their way to attack the more industrious, agricultural peoples, Wakikuyu or Wakamba, but we parted the best of friends. At this point, to get down into the rift valley, a small precipice of rough dolerite has to be descended; and this being cleared, we found the land covered with herds of cattle and goats. We passed several of the little square camps of the married people, and until we arrived at our camp on the first Kidong River, our ears never rested from the strains of the various troops of donkeys.

At this camp the country had a most curious appearance. It was eaten down to the ground. Scarcely a blade of grass was an inch long. It is owing to the habit, very unusual with a pastoral people, of camping in large numbers, that the Masai are unable to remain more than a few days in one spot, and also that the cattle disease has been so

deadly amongst these people, while the same fact is probably responsible for the formation of these bands of Elmoran.

Next morning when we started I saw to my disgust that their kraals were also on the march. The goats and cattle were collected into flocks and driven by the boys and slaves of their owners. Their huts, which are of a beehive shape, formed of hides stretched over curved sticks, were rapidly taken to pieces. A donkey was caught and six of these long poles tied on each side of it; then the hides were folded and laid on its back. Their caravan must have extended over nearly 10 miles.

PROF. G. F. SCOTT-ELLIOT.—*A Naturalist in Mid-Africa.* Ward, Lock, and Co. Ltd.

By permission of Messrs. Ward, Lock, and Co.

Kikuyu

Kikuyu might be described as the land of wild flowers and sweet-smelling grasses. One marches through a wonderful variety all day long; and growing, as they do, in kind of hedgerows between the paths and plantations, it reminds one forcibly of English lanes. Almost every acre is cultivated and occupied. Near all the villages are open patches of close, short turf, with clover, just like English grass; and, if not for the banana groves, one might imagine one's self in Kent or Surrey, for the *vikwa* (large potato-like tubers of the yam family) are trained up poles, just like hops. As the lower slopes were gradually ascended, large patches of bracken and fern were seen on the hillsides, quantities of mignonette, a kind of dandelion, and other wild flowers, many very like the English species. The villages of the Wakikuyu are never found above an altitude of 6000 feet. Beyond the last plantations large areas of bracken fern 6 to 7 feet in height are seen; intertwining with this the common English bramble is found, and ripe blackberries can be gathered. Passing the bracken, one enters forest, and a more tangled mass of virgin forest it is impossible to

imagine. Large numbers of the trees were of gigantic dimensions. The trunks of these large trees are one hanging mass of ferns and lichens, these plants and mosses also forming a carpet under the trees. In the ravines are clumps of tree-ferns, which mingle with the other trees, and a view from the top of one of these ravines presents a scene of marvellous beauty. These ravines are often more than 3000 feet in depth, with sides as steep as 45 degrees. One day's march took us through this forest, after which we reached continuous woods of bamboo cane.

The food of Kikuyu consists of bananas, maize, millet, sweet potatoes, vikwa or yams; koonde, a kind of haricot bean; maweli and kimanga, which are small kinds of grain. The majority of the bananas are used in a green state. The Wakikuyu possess numbers of sheep, cattle, and goats, principally the latter. They are in daily terror of the Masai raiding parties, which were very frequent about the time of our visit, because the anthrax scourge was killing off nearly all the cattle in Masai Land, and they were raiding to increase their stock.

C. W. HOBLEY.—*Geographical Journal*, August 1894.

By permission of the Royal Geographical Society.

The whole of this graphic article, already referred to, should be consulted.

Lake Victoria Nyanza

The largest of the lakes of Central Africa—the Nyanza—covers an area of about 27,500 square miles, and is thus about the size of Scotland. Its banks are formed of grassy hills sloping gently to the shore, or of rugged stretches of rock soon giving place to higher mountain ranges or plateaus. The shores of the north, west, and south, along the lake from Uganda to Mwanza, display the character of a hilly country with occasional weather-worn cliffs; while in the south-east, east, and north-east we can speak of actual ranges of mountains or extensive plains.

A part of Uzukuma's country and great stretches of land farther on by the river Ruvana, in Ugaya and Kavirondo, consist of great plains and grassy steppes. Elevations of a considerable height are found in the ranges to the east. The northern, western, and south-western regions are, as a rule, more fertile than the others. The shores themselves abound in bays large and small, and at the south the Speke, Smith, and Emin Pasha gulfs cut deep into the land. The shallow water in the bays has generally a dull, dirty colour, and is traversed by broad stretches of dense papyrus, the haunt of numerous hippopotami and crocodiles. Where a brook or stream enters the lake, there is found around the mouth a singular mud swamp, which in these places shows no considerable difference of level between land and water; and it is by no means one of the pleasures of life to have to pass through a foetid swamp of this kind near the lake among papyrus stems 20 feet high. On one who stands on the shore of the lake, and allows his eyes to range over the broad expanse of blue water, the Nyanza produces an impression similar to that of the ocean.

Of the larger islands which lie along the shore we must mention the Sese archipelago, with its principal island of the same name; Uvuma, belonging to Uganda, and Ukerewe, in the south; and we should perhaps add Ugingo, in the east. Besides these islands, there is a broken chaos of small islets near the coast, some of them inhabited, some only serving temporarily as camping-places for fishermen, or travelling natives. The nature of the soil often differs fundamentally in the different islands. On one island especially, Ukerewe, we find dense, impenetrable primæval forest; another shows us fresh, green meadows, extensive fields without a tree; and a third consists of blocks of stone piled one upon another, in the crevices of which various kinds of underwood grow in rank luxuriance. It is a charming sight that these islands generally present, with the dense, dark green of the giant forest and the low, tangled underwood, the shore formed of blocks of stone of dazzling whiteness, and the foam of the blue waves dashing

high upon them. Numerous birds rise and fall on the undulating waves, or sun themselves upon the rocks: ducks, sea-gulls, sandpipers, cormorants, divers, and many others. The larger mammalia are wanting to these islands.

The depth of the lake varies much. We do not yet possess entirely reliable soundings, so that opinions on the subject are still at variance. From the circumstance that I observed waves of 6 feet in height and of a truly remarkable length, I draw the conclusion that the lake must be of a considerable depth in some places.

LIEUT. P. KOLLMANN.—*Victoria Nyanza*. Sonnenschein.

By permission of Messrs. Swan Sonnenschein and Co.

Uganda

Uganda, the most northerly and most powerful negro kingdom on the Victoria Nyanza, is peopled by a race which is entitled to our special attention in consequence of its high degree of civilisation, contrasting sharply in this with the other native populations. Uganda is without question the most fertile and productive territory on the Victoria Nyanza, and, according to the latest inquiry, it contains over 500,000 inhabitants. In its southern portions, bordering on the Nyanza, the interior exhibits the type of a hilly country. Gentle slopes covered with green grass, or with dense bush and forest, traverse the land. The valleys are moist with frequent showers, and thus form the best soil for the chief object of culture, the banana. Towards the German territory the undulating landscape passes into extensive steppes of underwood, till, in the north of Kisiba, ranges of heights again make their appearance. It not seldom happens that a surging mist settles for days together in the valleys; but in spite of the great moisture of the soil and the dampness of the air, Uganda is considered healthier than other Nyanza districts.

The chief occupation is agriculture. In Uganda they especially cultivate different kinds of bananas, beans, sugar-

canes, sweet potatoes, and many other vegetables which are taken as condiments to bananas, and coffee. The banana, which is indispensable to the Mganda, thrives there in splendid luxuriance. Large and beautiful groves cover the green, undulating land, among which the villages, often of considerable size, lie hid.

For the native the banana means almost life or death. He cooks it when unripe in large earthen pots, which are covered in with banana leaves. He roasts it at the fire; crushes meal from it; uses the fibre for all kinds of wicker-work, and for tying up and fastening his work; the leaves serve him as table-cloth; from the viscous sap of the trunk he prepares a kind of soap; and a valuable drink, something like lemonade, is obtained from the fruit, of which there are not infrequently 150 to 200 in a single cluster.

Bananas form the Mganda's chief food. These are placed unripe in the large pots, covered over with fresh leaves and steamed. They are eaten when soft and hot. Different kinds of vegetables are often cooked in water with meat and slices. If he lives in good circumstances the Mganda likes to eat meat either boiled or grilled over the fire. He either builds himself a framework of bars like a grate, on which he lays the pieces of raw meat, or he runs a slit through them and sticks it in the ground before the fire. The lake supplies an abundance of savoury food in the form of large and savoury fish, and the Mganda also eats locusts and white ants fried.

Boat-building is a matter of special importance to the Waganda, and they have brought it to great perfection. Though frail in appearance, a single canoe can hold as many as 100 men. Uganda is so far favoured that the most suitable wood for boats grows there, while in the other shore districts of the Nyanza scarcely any forest trees flourish except poor, stunted specimens. The Waganda venture out on the stormy lake against wind and weather, and urge their boats through the high waves, singing monotonous songs. When lake and wind are calm, their boats, driven by

rhythmic strokes of the oar, can be seen shooting along with the speed of an arrow. Not a single nail or other article of metal is used in fastening the separate parts of the boat and binding them to one another, but all the pieces are sewn together. Thin, fine wattles serve as thread.

LIEUT. P. KOLLMANN.—*The Victoria Nyanza*. Sonnenschein.

By permission of Messrs. Swan Sonnenschein and Co.

Tribes of Uganda

Several tribes are to be found in Uganda, living in different districts, or scattered throughout the country.

The most important tribe in every respect is that of the Waganda. They are pure negroes, with dark, chocolate-coloured skins, and short, woolly hair. The men are rather above the average height, well-made and powerful, and the women, when young, are often good-looking, with small, neat hands and feet.

The Wahuma, who come next in importance, are a singular race; under the names of Watusi and Wahuma they are found scattered throughout Eastern Central Africa, from the equator to the seventh parallel of south latitude. They are a fine, tall race, with handsome, oval faces, and straight noses. Wherever met with, the Wahuma are the herdsmen of the country, living chiefly on milk and flesh, and but rarely cultivating the ground, and consequently in Uganda, where they are despised, it is almost impossible to induce a Mganda to tend cattle. These Wahuma are a very exclusive race; they have a distinctive language of their own, live in out-of-the-way villages, generally on the borders of the jungle, and rarely intermarry with the surrounding tribes.

FELKIN and WILSON.—*Uganda and the Egyptian Sudan*. Low.

By permission of Dr. R. W. Felkin and Messrs. Sampson Low and Co.

Ruwenzori and the Semliki Valley

If you draw a straight line from the debouchure of the Nile from Lake Albert, 230 geographical miles in a direction nearly south-west magnetic, you will have measured the length of a broad line of subsidence, which is from 20 to 50 miles wide, that exists between 3° N. lat. and 1° S. lat. in the centre of the African continent. On the left of this great trough, looking northward of course, there is a continuous line of upland, rising from 1000 to 3000 feet above it. Its eastern face drops abruptly into the trough; the western side slopes gently to the Ituri and the Lowa basins.

To the right there is another line of upland. The most northerly section, 90 miles, rising from 1000 to 3000 feet along the trough, is the Unyoro plateau, whose western face almost precipitously falls into the trough, and whose eastern face slopes almost imperceptibly towards the Kafur.

The central section, also 90 miles long, consists of the Ruwenzori range, from 4000 to 15,000 feet above the average level of the trough. The remaining section of upland, and the most southerly, is from 2000 to 3500 feet higher than the trough, and consists of the plateaux of Uhaiyana, Unyampaka, and Ankori.

The most northerly section of the line of subsidence, 90 miles in length, is occupied by the Albert Nyanza; the central section, also 90 miles, by the Semliki River valley; the southernmost portion, 50 miles long, by the plains and the New Nyanza, which we have agreed to name the Albert Edward Nyanza.

The part of the Semliki valley which extends from Lake Albert south-westerly is very level; for 30 miles it only attains to an altitude of 50 feet above the lake. All this part can only have recently been formed, say the last few hundred years. In one of its crooked bends nearer the south-eastern range we stumbled suddenly upon the Semliki River, with an impetuous volume, from 80 to 100

yards wide, and an average depth of 9 feet. Its continually crumbling banks of sandy loam rose about 6 feet above it. One glance at it revealed it to be a river weighted with fine sediment. When we experimented, we found a drinking-glass full of water contained nearly a teaspoonful of sediment. For miles the south end of Lake Albert is so shallow that it will scarcely float a row-boat.

Beyond the grassy portion of the valley, a few acacias begin to stud it, which as we proceed south-westerly become detached groves, then a continuous thin forest until it reaches the dense and rank tropical forest, with tall trees joined together by giant creepers, and nourishing in its shade thick undergrowth. Everything now begins to be sloppy, wet leaves and branches glisten with dew, weeping mosses cover stem, branch, and twig. The ground is soaked with moisture: a constant mist rises from the fermenting bosom of the forest. In the morning it covers the valley from end to end, and during the early hours stratum after stratum rises, and, attracted by the greater draught along the slant of the Ruwenzori slopes, drifts upwards, until the summits of the highest mountains are reached, when it is gradually intensified until the white mist has become a storm-cloud and discharges its burden of moisture amid bursts of thunder and copious showers.

The valley rises sensibly faster in the forest region than in the grassy part. Knolls and little rounded hills crop out, and the ground is much more uneven. Violent streams have ploughed deep ravines, and have left long narrow ridges scarcely a stride across at the summit, between two ravines a couple of hundred feet deep. At about 75 miles from the Albert Nyanza the valley has attained about 900 feet of altitude above it, and at this junction the forest region abruptly ends. The south-west angle of Ruwenzori is about east of this, and with the change of scene a change of climate occurs. We have left behind eternal verdure, and the ceaseless distillation of mist and humid vapours into rain, and we now look upon grass ripe for the annual fire and droughtiness.

From this place the valley becomes like a level grassy plain until the Albert Edward Nyanza is reached.

The southernmost stretch of the Ruwenzori range projects like a promontory between two broad extents of the ancient bed of the Albert Edward. To avoid the long detour we cross the hilly promontory in a south-easterly direction from the Semliki valley, and enter Eastern Usongora, and are in a land as different from that at the north-western base of Ruwenzori as early summer is from mid-winter. As we continue easterly, we leave Ruwenzori on our left and the strangely configured Albert Edward Nyanza on our right. The broad plains which extend between were once covered with this lake. Indeed, for miles along its border there are breadths of far-reaching tongues of swamp penetrating inland. Streams of considerable volume pour through these plains towards the Nyanza from Ruwenzori, without benefiting the land in the least. Except for its covering of grass—at this season withered and dried—it might well be called a desert; yet in former times, not very remote, the plains were thickly peopled—the zeribas of milk-weed, and dark circles of euphorbia, wherein the shepherds herded their cattle by night, prove that, as well as the hundreds of cattle-dung mounds we come across.

SIR H. M. STANLEY.—*Scottish Geographical Magazine*, January 1890.

By permission of Sir H. M. Stanley and of the Royal Scottish Geographical Society.

Ruwenzori

We had a magnificent view of Ruwenzori just before sunset one evening during our halt in Mtsora. A large field of snow, and snow peaks beyond the foremost line, appeared in view. During the whole day our eyes had rested on a long line of dark and solemn spurs loomed up one after another, and a great line of mountain shoulders stood out; then peak after peak struggled from behind night-black clouds into sight, until at last the snowy

range, immense and beautiful, a perfect picture of beautiful and majestic desolateness, drew all eyes and riveted attention, while every face seemed awed. The natives told us that the word Ruwenzori means the Rain-Maker, or Cloud King.

SIR H. M. STANLEY.—*In Darkest Africa.* Low.

By permission of Sir H. M. Stanley and Messrs. Sampson Low and Co.

For the exploration of Ruwenzori, see G. F. SCOTT-ELLIOT, "Expedition to Ruwenzori," *Geographical Journal*, October 1895; and for the latest account, J. E. S. MOORE, *To the Mountains of the Moon.* Hurst and Blackett.

Lakes Albert and Albert Edward Nyanza

The Lake Albert reminded me much of the Nyasa. Like it in shape, the opposite shores were clearly visible across the blue waters, though to the north the lake appeared limitless. Along the eastern coast of Nyasa runs a range of blue mountains, while the western shores slope gently to the lake. So it is also with the Albert, for the high plateau of Unyoro (over 5300 feet above the sea) ceases suddenly, and precipitous cliffs descend to the trough of the lake (2170), which look, across the water, like a range of lofty mountains. Sitting on the white sands, with the waves rolling lazily to my feet, I could imagine myself back on the shores of Nyasa.

The Sudanese villages on the lake shore grew nothing but cotton, which the women were collecting all day in the fields, and which they sent to headquarters in exchange for food. Such few natives as we met were of a low type, and lived in constant fear of the raids of the Wanyoro. They eked out a living by fishing, and by washing in earthen troughs the saline deposits around their villages. The water thus impregnated with salt was allowed to evaporate, and the crystal deposit was then collected and exchanged for food.

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The Albert Edward Lake, which lay spread out at our feet, was very beautiful. No reeds or marsh-growth here broke the outline of its shores ; and wooded islands in the foreground studded the expanse of water, which stretched onwards till it met the horizon in the far and hazy distance. On the other side lay the crimson-water Salt Lake, its fringe of salt looking like ice. Each stick and stone was alike encrusted, and bore out the resemblance to a half-frozen pond. Beyond rose the lesser mountains—giant peaks themselves—which formed the bulwarks of the snow-clad summits of Ruwenzori.

SIR F. LUGARD.—*Our East African Empire.* W. Blackwood.

By permission of Messrs. W. Blackwood and Sons.

V. THE CONGO

The Course of the Congo

FROM the slopes of the Chibale mountain group, south of the Tanganyika lake, the Congo issues into the hollow of the table-land lying between the Tanganyika and the eastern extremity of the Mushinga range, and, swollen by myriads of small streams into a great river, flows westward under the native name of Chambezi into an oval depression, where it forms a lake called Bangweolo. At the western extremity of this lake, an arm of it, like an estuary, extends north. Thence the river issues under the name of Luapula, similar in width to the Thames at London; and for 100 miles it continues its course northward till it empties into a lake called Mweru, covering a superficial area of 2100 square miles. Issuing from the northern shore of Mweru, the Luwa, as it is now called, enters a rent in the mountains of southern Rua, and descends by a series of falls and rapids to a much lower level, whence by the numerous accessions it receives, notably from a lacustrine river called the Lualaba, it flows a mighty stream north-north-west, every league of its course receiving tributaries from the east and west. From the right, through a gap in the mountain barrier that encloses it on the western side, Lake Tanganyika, that has collected over a hundred rivers in its capacious bosom, empties its surplus waters by the Lukuga into the broad Lualaba. From the left a chain of lakelets, after gathering from weeping forests and spongy areas, discharge their collected strength into the large and ample river.

Now that we understand the course of the Congo, or Lualaba, it is not difficult to understand the character of its basin, and the cause of the almost unrivalled amplitude of waters discharged by the Congo into the sea. On the south, the east, and the west, the three mountain walls, or barriers of table-land, discharge their numberless streams into a plain-like basin furrowed by the courses of five noble rivers running northward in nearly parallel lines with the Lualaba, draining a level 800 miles broad. After a course varying from 600 to 1100 miles they issue into the Congo in its transverse flow from east to west. Towards the north a table-land descends gradually into another level, 600 miles broad and 200 miles deep, furrowed by four rivers flowing southerly into the wide river. On the whole, then, we may compare it to a huge meat-dish, nearly square, surrounded by a low broad rim with corners rounded off. It is as though, in very ancient times, the days of great inland seas, this capacious and ample basin formed a great lake three times greater than the area of the Caspian Sea. Since that period, some volcanic agency, it may be, cracked and sundered the hilly rim to the west, and the waters flowed through to the Atlantic Ocean, and the even bottom of the lake was exposed, which we see now to be furrowed by voluminous affluents flowing from the south to the Congo as it flows westerly.

At Nyangwe, 1700 miles by river from the sea, and near 1300 miles from its source, the river is about a mile wide, with a volume of 230,000 cubic feet per second. Lower down it receives the Lowwa, Lomani, Aruwimi, Ubangi, Sanga, and Kwa, which swell this volume to 1,000,000 cubic feet per second. From Nyangwe it has a northerly course of 4 degrees of latitude; when reaching the equator it deflects N.N.W. to above 2° N. One degree north of the equator—so numerous have been the streams and rivers shed by the western versant of its eastern mountain boundary—the Congo widens, disparts into ten or twelve channels, and from shore to shore of the main channel it is as much as 16

miles in its greatest breadth. With an average width of 4 or 5 miles it flows direct west for 2 degrees, then S.S.W. across $2\frac{1}{2}$ degrees of longitude, when it gathers itself together and in one united stream, gradually narrowing to a mile in width, in depth from 50 to 200 feet, it flows with a strong current until it expands again at Stanley Pool, which is 18 geographical miles in length by 14 miles greatest width. At the lower extremity of the Pool, 1000 feet above the sea, the navigability of the Congo ceases. It first precipitates itself with awful force down a five-mile slope, a succession of leaping waves, which from crest to crest might be about 300 feet apart, then, by a series of mad rapids, separated by short stretches of swift but steady flows, for 75 miles, all of it confined by the towering rock barriers of a cañon from 300 to 600 feet below the level of the opposing summits of the cleft-land, then for 88 miles tolerably safe to navigation, followed by another 60 miles rush of a distracted river, with roaring cataracts alternating with noisy rapids, through the deep, rocky heart of the grim and solemn-looking hills, until, finally, the last plunge has been made down the Yellala Falls. A few miles lower down it issues out of the sinuous and rocky gullet a navigable and useful river for 110 miles ; flows by factories and villages and townships to be presently vexed by the churning screws of ocean steamers and panting tug-boats.

SIR H. M. STANLEY.—*Scottish Geographical Magazine*, 1885.

By permission of Sir H. M. Stanley and of the Royal Scottish Geographical Society.

Scenes on the Congo

(a) View from Ijumbi

From the broad summit of Ijumbi we have a wide-spread panorama of billows and hollows, covering an area of 2000 square miles. Its commanding altitude will enable generations of tourists in time to come to under-

stand, by one glance round, the character and features of the region of the Lower Congo. Towards the north-east they will obtain the first glimpse of Stanley Pool, 16 miles distant. Dover Cliffs at sunset will show their white, glistening walls, and every peak at the entrance of the Upper Congo will be easily distinguished. In an air-line they are 35 miles away. To the southward we can now see our red road winding conspicuously past palm clusters and hamlets, dipping into the green wooded hollows, and rising up the lengthy slopes. Even Mowa is distinctly visible, while the twin peaks near Nsangu Ferry offer unmistakable landmarks. If we look on the right bank, all the land from Mowa to Dover Cliffs, a distance of 70 miles, is clearly mapped out, with its numberless wrinkles and irregularities softened by distance to mere trifles. The south bank is seen of similar length and irregularities, while between the Congo's gorge may be followed till it is lost in the blue.

(b) On the Mid-Congo

For purely tropical scenes I commend the verdurously rich isles in Mid-Congo, between Iboko on the right bank, and Mutembo on the left bank, with the intricate and recurrent river channels meandering between. Some of the smallest islands seem to be aflame with crimson colouring, while the purple of the ipomæa, and the gold and white of the jasmine and mimosa diffused a sweet fragrance. They are blessed with a celestial bounty of florid and leafy beauty, a fulness of vegetable life that cannot possibly be matched elsewhere, save where soil with warm and abundant moisture and gracious sunshine are to be found in the same perfection. Not mere things of beauty alone are these isles. The palms are perpetual fountains of a sweet juice, which, when effervescing, affords delight and pleasure to man. The golden nuts of other trees furnish rich, yellow fat, good enough for the kitchen of an epicure, when fresh. On the coast these are esteemed as an article

of commerce. The luxuriant and endless lengths of calamus are useful for flooring and verandah mats, for sun screens on river voyages, for temporary shelters on some open river terrace frequented by fishermen, for fish-nets and traps, for field baskets, market hampers, and a host of other useful articles, but more especially for the construction of neat and strong houses, and fancy lattice



NATIVE CLIMBING PALM TREE.

work. That pale white blossom is the caoutchouc plant, of great value to commerce, which some of these days will be industriously hunted by the natives of Iboko and Bolombo. For the enterprising trader there is a ficus, with fleshy, green leaves; its bark is good for cloth, and its soft, spongy fibre will be of some use in the future for the manufacture of paper. Look at the various palms crowding upon each other. Their fibres, prepared by the

dexterous natives of Bangala, will make the stoutest haw-sers, the strength of which neither hemp, Manilla fibre, nor jute can match. See that soft, pale green moss draping those tree-tops like a veil. That is the orchilla weed, from which a valuable dye is extracted. I need not speak of the woods, for the tall dark forest that meets the eye on bank and isle seem to have no end.

(c) Stanley Falls

Stanley Falls consist of seven distinct cataracts extended along a curving stretch 56 miles in length. At $0^{\circ} 28' 30''$ N. lat., and $25^{\circ} 24'$ E. long., we find the seventh cataract, which, with its smaller rapids, interrupts navigation for 2 miles. Above this fall there is a navigable stretch of 26 miles, whence the sixth cataract is reached. This latter cataract, on the left side, presents an absolutely impassable fall; but on the right it partakes of the character of rapids, which at certain times of the year would offer few more difficulties than vigorous rowing would not surmount. From the sixth to the fifth cataract is another 22 mile stretch of easily navigable water with a gentle current. The fifth, fourth, third, second, and first cataracts are so close together that we only reckon them by the number of distinct waterfalls. Nine miles' journey overland will enable us to pass them all.

SIR H. M. STANLEY.—*The Congo*. Low.

By permission of Sir H. M. Stanley and of Messrs. Sampson Low and Co.

Oil-palm Forests in Belgian Congo

Kinshasha is the African headquarters of the Huileries du Congo Belge. The oil-palm forests owned by the Company are many hundred miles farther away in the interior. They are all favourably situated in the neighbourhood of navigable waterways, some being served by the main stream of the Congo as highway of communication, others by its broad tributaries. By the way, Kinshasha

has recently been renamed Leopoldville, and, in conjunction with its neighbour of that name, decreed the capital of the Belgian Congo; but it is still referred to commercially as Kinshasha. . . . Five concessions, each covering many thousand acres, have been opened up in different districts. Their respective centres are Leverville, Brabanta, Flandria, Alberta, and Elisabetha.

The fruit is packed in baskets and taken down to the mid-forest railway. It goes on by train to the factory in Alberta, where machinery reduces it to a pulp and liberates its palm-oil contents. The nuts, now also free, are mechanically transported to another machine which cracks them. The oil is pumped into storage tanks, to await the regular arrival of one of the Company's tank river-boats. When the steamer comes alongside, the oil is pumped into it and taken in bulk to Kinshasha.

EDITH A. BROWNE.—*Vegetable Oils in Peeps at Industries*, 1926.
A. and C. Black, Ltd.

Scenery of the Upper Congo

We stopped about eleven o'clock to do some necessary washing and cooking. The spot chosen was a long stretch of sand, backed by thick forest. On the moist, smooth shore were hundreds of butterflies, many of most beautiful colours, azure blue, and brilliant leaf green. The forest above rising above the sandbank was intersected with paths made by the buffaloes coming down to drink; and farther towards the interior was an open space trampled with their footmarks, the whole place having a strangely farmyard look about it. In the forest were many cnestis bushes with bright scarlet seed vessels, and others with orange pods, so that the masses of green leaves were quite enlivened by these points of colour. We met some canoes this afternoon filled with ivory, but with this exception there was no sign of man for some distance after leaving Kimpoko. The country, especially on the western bank, appears quite uninhabited, and is a beautiful, uncultivated

waste, with verdant slopes like natural meadows, clumps of shady forest and numberless rills of water. The vegetation overhanging the river is of a very rich character, and endlessly varying and charming effects; above all, when it is mirrored in some tranquil bay, where the deep green of the foliage becomes enhanced by a brilliant shore line of yellow-white sand, and the tender grace and the fanciful forms of the many parasitic creepers contrast with the whitened snags and fallen trees which rear their gnarled limbs out of the placid water.

SIR H. H. JOHNSTON.—*The River Congo.* Low.

By permission of Sir H. H. Johnston and of Messrs. Sampson Low and Co.

The Exit of the Lukuga from Lake Tanganyika

On the 3rd of May there was a slashing breeze freshening up from the eastward, and I made sail with many a hope that I might in a few hours find myself in the out-flowing Lukuga. Shortly before noon I arrived at its entrance, more than a mile across, but closed by a grass-grown sandbank, with the exception of a channel 300 or 400 yards wide. Across this there is a sill where the surf breaks heavily at times, although there is more than a fathom of water at its most shallow part. The chief visited me and informed me that the river was well-known to his people, who often travelled for more than a month along its banks, until it fell into a larger river, the Lualaba. It rained very hard in the morning, but in company with the chief I went 4 or 5 miles down the river, until navigation was rendered impossible, owing to the masses of floating vegetation. Here the depth was 3 fathoms; breadth, 600 yards; current, one knot and a half, and sufficiently strong to drive us well into the edge of the vegetation.

COMMANDER V. L. CAMERON.—*Across Africa.* George Philip and Son.

By permission of Messrs. Philip and Son.

A First Sight of Lake Tanganyika

Half an hour's walk through the thin forest brought us to the edge of the great lake crevasse of Tanganyika, and the scene that burst upon us seemed almost like fairyland compared with the monotonous features of the country we had just crossed. We had arrived at the most southerly point of Tanganyika, where as fine a prospect is presented as at any other place on the lake. It here forms a narrow acute angle running in to the subtending plateau. On the left a point of land extends into the water like a huge quay, rising to a height of 300 feet in sheer rocky precipices, and topped by a dark green covering of trees, contrasting with the grey and the red of the sandstone cliffs. Over this could be discerned the placid Bay of Pambete, with its surrounding of picturesque mountains, from 2000 to 3000 feet above the lake, presenting a charming variety in the level bordering strip at the base, the lower rocky talus, and upper precipices, over which two beautiful cascades could be seen falling like silvery films. Over the point, three emerald islands showed themselves. On the right, or eastern side, the shore takes a fine sweep round to the north, and rises in steps and steep inclined plains, covered with a dense vegetation, and culminating in the grand Lambala-ma-fipa Mountains, 8000 feet above the level of the sea. At our side a delightfully clear stream dashed, in joyous babbling by pool and cascade, till it tumbled laughingly into the lake. From our feet extended the Tanganyika in expansive beauty, with its broken shore-lines, and threatening walls of rock, its capes and islands, here sweeping round in a fine bay, there forming a miniature fjord. As we stood and looked, enchanted by the scene, the morning sun, getting above the mountains and clear of the enveloping clouds, struck the water, and from its rippling bosom the rays were reflected, forming a veritable field of gold, in which the green capes and islands lay like emeralds. The air was cool, and pervaded by a strong odour of flowers, which grew in profusion

about us. The chirp of a few birds was heard, and water fowl were to be seen in abundance on the lake. We felt as if we had passed from a purgatory to a paradise, so complete and glorious was the change.

JOSEPH THOMSON.—*To the Central African Lakes and Back.*
Low.

By permission of Messrs. Sampson Low and Co.

Lake Tanganyika

Lake Tanganyika is 330 miles in length, with a coastline of 900 miles. Although of such large extent, and of such variety of aspect, there is a general sameness in the Tanganyika scenery; the whole basin forms in fact a vast chasm enclosed within mountain ranges or cliffs, terminating in elevated plateaus, a few lower lands intervening, natural gaps in the ranges, banks, and deltas formed by eroding torrents, and in a few localities, such as at Ujiji and elsewhere, a strip of shelving beach in an east and west direction breaks the general north and south line of the lake. North of Ujiji the surrounding mountains approach the lake shore with but a small interval of low undulating hills, and have the appearance of meeting some distance north of the lake. The extreme north end, however, is low alluvial land, with banks of reed and papyrus.

E. C. HORE.—*Proceedings Royal Geographical Society*, January 1882.

By permission of the Royal Geographical Society.

For a graphic detailed description of the scenery, see *ibid.* pp. 4-6.

Ujiji

The traveller would naturally expect on arriving at Ujiji to look to the westward over the lake; but the lake view is due south, where on a clear day Capes Kungwe and Kabogo may both be seen, and sometimes even the mountains of Marungu. East, the gap is just visible across

the Ruiche River, through which Ujiji is reached in that direction. South-east, the shore of the lake, in a long vista of capes and bays, disappears in the dim distance.

The big town occupies a central position on the southern-facing shore, and numerous smaller villages are dotted both along the coast and here and there over the low country. Thirty or forty large flat-roofed Arab houses, mostly hollow squares with massive walls and broad verandahs, form the principal feature of the town, and with erections of every kind between that and the little grass bee-hive hut very irregularly placed among straggling oil-palms, bananas, and fruit gardens, make up the metropolis of Ujiji. A few winding tracks between those, worn down by common use, form the streets or roads, mostly converging eventually upon the market-place.

E. C. HORE.—*Tanganyika*. Stanford.

By permission of Mr. Edward Stanford.

For a description of Ujiji market, see *ibid.* pp. 70-73.

Lake Kivu and the Mfumbiro Mountains

On a summit near a village we came in sight of a long streak of silvery water lying far below us in a great trough. At the south-east corner of this sheet of water, which passed out of sight behind some rising ground to the north, a river found its way out to the south between the hills, rushing in a white lacework of foam through a rocky gorge, and with a roar that made itself distinctly heard, though we were at least 4 miles away. The beautiful expanse of water was Lake Kivu, and the river was the Rusizi at its source. The scene from where we stood was beautiful in the extreme. All the country near at hand lay flooded with yellow sunshine, the great down-like hills were covered with bright green grass, and in the steep valleys between them there were patches of forest which were almost black. The lake itself was a pale silvery blue, and on the other side the mountains rose again in every con-

ceivable shade of pink and purple, till they culminated to the north in a dark, jagged mountain range.

We now decided that Fergusson and I should go right up to the north end of Kivu in the boats, while the rest followed at their leisure overland. All the way I was continually looking to the north, for I expected that at any time we might come in sight of the great Mfumbiro Mountains, which rise immediately to the north of the lake, but for some reason or other connected with the atmospheric conditions it was not till we reached a point only one day's journey from the north shore of Kivu that we saw anything of them. Here we were looking for a place on which to pitch our tents, along a point that ran out from the eastern shore. There was some flat ground to the top of it, and on passing through some trees to obtain a view up the lake, there appeared to the north three huge mountain peaks, each rising with that delicate upward curve which one always finds characteristic of volcanic cones throughout the world. Late next day, after rounding a huge mass of mountains which stood out from the east, we reached the northern shores of the lake. Unlike that of most other portions of Kivu, the coast is here composed of sand, while but a few miles to the west it is formed almost entirely of the rough, more or less recent, lava, which has descended directly from the great cone of Kirunga-cha-gongo into the lake. The slope of this huge volcano, which we could now see rising dimly beyond the nearer forest and topped by a vast pine tree-like cloud of smoke and steam, begins really on the shores of the lake itself, and all the gradually rising forest-clad lava-fields are studded with secondary cones.

J. E. S. MOORE.—*To the Mountains of the Moon*. Hurst and Blackett.

By permission of J. E. S. Moore, Esq., and Messrs. Hurst and Blackett.

Lake Mweru and the Luapula

Rhodesia station is situated at the extreme north-east corner of Lake Mweru, on a cliff some 80 feet above the lake shore. Rhodesia is on the direct road to the west, and is the nearest point of Mweru to Tanganyika. I left there in a boat with six natives on 4th October. One day took me the length of the northern coast of the lake to the north-western corner. On 5th October I passed the exit of the Luapula River and sailed down the west coast of Mweru to Chipungu's town. Thence in three more days to the southernmost corner of the lake. The northern half of Mweru's west shore is bounded by cliffs rising abruptly from the lake shore to 150 or 200 feet. Below these cliffs there is absolutely no level ground—nothing but a mass of broken rocks which have fallen from above. It is only here and there, where small streams from the hills behind have broken gorges through the cliffs and carried out deltas of rich loamy soil, that a landing can be safely effected or habitations met with. On each of these little deltas is a small village or collection of huts. In lat. $9^{\circ} 5' S.$ lat. the cliffs cease, and then going south the lake is bordered by flat lands and marshes. All the southern end is very shallow, the depth 3 miles out from shore being only from 8 to 12 feet. This end of Mweru is gradually filling; the Luapula is silting it up. It enters Mweru by several branches, or rather it has formed many reedy islands at its mouth. It is easy to see at the mouth of the river how the swamps lying at the south end of the lake have been formed. Floating plants are carried down and collect together, reeds take root on them, an island is formed, and the deposit brought down by the river joins island to island. The depth at the entrance is 7 or 8 feet (dry season). Once inside the river the depth increases to 3 fathoms, and from the lake right up to the Falls of the Luapula there is never a less depth than 10 feet. It is a magnificent river, from 250 yards to one quarter of a mile in width, slow running with clear water, no rocks or sandbanks

From Mweru up to the Falls the rate of current is from one mile to half a mile per hour. It is a very similar river to the Upper Zambezi, just above Zumbo, except that the current is much slower than that of the Zambezi.

A. SHARP.—*Geographical Journal*, June 1893.

By permission of A. Sharp, Esq., and of the Royal Geographical Society.

Lake Bangweolo

A pleasant walk through beautifully wooded country brought us out on to a narrow plain covered with cultivation. To our right front rose sand-dunes 100 feet high. From the top of one, which I ascended, there was a view of the great lake. There it was—Bangweolo! stretching away to the north-east and east, an unruffled sheet of steely-blue water glittering in the bright sunshine. The coast to the south curved towards the north in two crescents. Our side was all pure white sand, with stunted trees and bushes, the country lying behind us forming belts of swamps, waist deep in hot, black mud and water.

Bangweolo deserves its name—"where the sky and water meet." They do, or they seem to do so, for there is seldom any perceptible horizon to be seen when standing on a level with the lake; and what colouring! An hour before, to half an hour after sunset, the whole scene is an exquisite blending of æsthetic colouring; and there seems to be a constant haze over Bangweolo, which has a marvelously softening effect, while the blending of colours is at times indescribably beautiful.

The water, up to 200 yards or so from the shore, is a sage green, and farther on it is the very clearest, purest, and most limpid blue. Fringing the sandy shores of snowy whiteness is a mass of every tint of green, except where the line of sand-hills rises, covered with dense scrub of a dull-green colour, almost blue. Bangweolo is of no depth. I sounded in many places, but never got a sounding over 15 feet. Its surface is therefore usually still, a very strong

wind raising but the smallest sea. It appears to me nothing but a flooded district. I fancy that it was formed by the water from the great watershed of the Tanganyika plateau, with its very plentiful supply, gradually overflowing the country at the base. The overflow has been checked to the west and south-west by a rim of rock; but the east and south-east have no such barrier, and in that direction there is a vast swamp from 20 to 40 miles in breadth.

The position of the mouth of the Chambezi can only be guessed at, as there is a sea of papyrus round it. No one could suppose there was the mouth of a river near. The natives told me that the water was too shallow for a canoe to ascend it in a dry season. It takes days to reach it through the intricate winding channels in the papyrus.

P. WEATHERLEY.—*Geographical Journal*, September 1898.

By permission of P. Weatherley, Esq., and of the Royal Geographical Society.

Climate of the Congo

The climate of the Western Congo naturally varies from indifferent degrees of healthiness and temperature, according to the regions through which the river passes, but on the whole it may be said to be infinitely superior to that of the Niger or the Gold Coast. The great absence of low, marshy ground about its banks is doubtless the cause of less virulent fever, and the regular cool breezes from the South Atlantic greatly reduce the tropical heat. The river probably is least healthy between Boma and the sea, owing no doubt to the mangrove swamps that inevitably attend the widening out of the embouchure. Boma itself is decidedly insalubrious. It is the hottest place on the Congo, and surrounded by many marshes. Towards Vivi it becomes decidedly healthier, owing to the greater elevation, and the higher you proceed up the river, the healthier the climate becomes. One aid to salubrity is the magnificent drinking-water that may be had everywhere above Boma; not the water of the Congo, which,

though unwholesome, has a disagreeably sweet taste, but the water from the unnumbered rills and rivulets which are everywhere trickling, wet and dry season alike, all the year round. Beyond Stanley Pool I can only call the temperature delightful.

The great fault of the climate lies in the excessive damp. Even in the dry season there is great moisture in the air, for, though there is no downright rain, yet the mornings and evenings are ushered in by dense white mists, like low-lying clouds, which incessantly filter through the clammy atmosphere a drizzling, vaporous spray that descends over everything like a heavy dew. This is the "cacimbo" of the Portuguese colonies, and the "smokes" of the Guinea coast. These morning and evening mists are characteristic of the dry season, and during the rainy months they disappear, and the beginning and closing of the day are generally bright and clear.

The relative length of the rainy season varies as you advance from the mouth of the Congo towards the equator. Near the sea there are about four months of rain—November, December, February, and March—with an intermediate dry season in the month of January; but ascending the river you find this gradually altering, and on Stanley Pool the rains commence in October, and continue till about the 20th of May, thus leaving four months of dry season. There is also here no interval in January, no "little dries," as they are called. Higher up the river still, approaching the equator, the natives tell me it often rains in June, August, and September, so that this may be called a true equatorial climate, where rain is seldom absent, and consequently, as we find at Bolobo, this is the region of perpetual forest.

SIR H. H. JOHNSTON.—*The River Congo.* Low.

By permission of Sir H. H. Johnston and of Messrs. Sampson Low and Co.

Climate of the Welle Country.

The altitude of the district of the Upper Welle, at 28° east and $3\frac{1}{2}^{\circ}$ north, is 2500 feet above the sea, descending in its western portion, at 24° and 4° north, to 1400 feet. The river is navigable almost throughout its entire course. There are few rapids, where portage of goods is necessary, but the boats themselves can travel the whole distance without difficulty. The rainy season begins about the middle of July, and lasts till about the middle of December. It does not rain continuously for two or three days together, but generally in the afternoon and at night. The shorter rainy season is from about the 15th of February to the 15th of March. During the other months of the year, though the climate is warm, the temperature rarely exceeds 92° Fahrenheit. The nights are always cool and fresh, accompanied by heavy dews, but there is much malaria in the country, owing to the large quantity of water and marshy tracts. By some of the tribesmen names are given to the months in keeping with what is done in them. Thus one is named as that in which they sow maroo, the chief ingredient used in brewing native beer; another as the season when maroo must be cut. Following this comes the "bad water" month, when the risk of fever is greatest; then elephant month, when they catch the elephants by burning the grass; and the white ant month, during which white ants are collected, and considered a great delicacy; and a second maroo month, when a second crop is sown. The month next to this has no distinctive name, and is succeeded by the second maroo harvest month, when provisions are scarce; the second ant-gathering month; a later sowing month; and, finally, another with no particular title.

CAPTAIN GUY BURROWS.—*Land of the Pigmies*. C. A. Pearson.

By permission of Messrs. C. Arthur Pearson, Ltd.

The Central African Forest and its Pigmy Tribes

Imagine a space of earth four times the size of England, Scotland, and Wales, crowded with colossal trees from 1 to 5 feet in diameter and 200 feet in height, with their thick, glossy foliage so interlaced that the hot, glaring sun of the tropics is quite shut out, and each tree seemingly lashed to the other by endless lengths of numberless cables, ranging from the tender thread-like creeper to the thickness of the old hempen hawsers of a line-of-battle ship, and these presenting such a maze of curious festoons, loops, and slack ropes, such confusing meshes and utmost disorder, that frequently they remind you of a fleet of ships in a dock, on which the riggers have been playing tricks with the ropes and the halyards. And underneath the thick, impervious shades is the impenetrable undergrowth, often of such close growth that you fancy you could travel best above the tops rather than through it. Imagine the forks of each tree crowded with little conservatories of orchids and ferns, and the great horizontal limbs, burdened with grey-green lichens with leaves as large as prize cabbage, and drooping growths of epiphytes, or air plants, and hosts of tendrils with their delicate points swinging ceaselessly about, and here and there great swaying walls and nodding towers of vines, around the flowers of which the wild bees hum, and the fierce wasps dart, and brilliant butterflies sail in myriads.

Let the ground be fat and black, like rich hot-house soil; let the vines be of the greenest, and the wrinkled bark of the giant trees and their parasites be of the greyest; let the air be suffocating; let the vapours rise in blue clouds, thinly veiling the six-fathom-thick foliage above; let the murmur of the insects above, below and around be heard, indicative of the seething life that finds existence in the hot, damp shades. Then imagine yourselves dazed and mazed in this weird shadowland, and marching from dawn to dusk in a perpetual duskiness, lit at rare intervals by a little ray, or the flickering dust, of



AN ELEPHANT TRACK IN THE EQUATORIAL FOREST, UPPER CONGO.

sunlight, and you will have a dim idea of the forest of Darkest Africa.

But you must take a broader view to comprehend its vastness, and its terror to houseless wanderers. You must think of the great rivers, the Welle or Makua, the Aruwimi, the Lindi, the Lowwa, and Lulu, rolling down in dark brown volumes to the Congo, hundreds of miles, each winding north and south across a degree of latitude as they flow westward, and each fed by never-ceasing rains—absorbing countless streams from either bank—Stygian dark in colour, either coursing impetuously through the murmuring depths of the forest, or lazily oozing from under floating beds of lilies, pistia, and duckweed, while the sickening sweet odours are almost overpowering. In a day's march we would cross over several streams; once we crossed thirty-two in a ten-mile march—three creeks, rivers, or rivulets per mile. The rain came after bursts of thunder, displays of dazzling lightning, and raging tempests, and lasted from four to fifteen hours, with such copious falls that it drowned the land. Day and night round about us great trees fell, or parted with their branches. Once a hoary old patriarch that must have weighed 20 tons fell within a yard of our boat, and created a wave that almost capsized us.

People this great tract with small tribes dwelling amid the wreckage of mighty woods, from 10 to 30 miles apart, in absolute ignorance of any world but their own, possessed of such a mania for meat that no animal life is rejected. Human flesh is as much sought after as is the flesh of the beasts in this country, though fortunately it is protected by dangers to the hunters. But by craft, superior boldness, or accident, victims are often secured, and serve to satisfy depraved appetites. We were compelled to bury our dead in the river, lest the bodies should be exhumed.

In the more easterly parts of the forest we find several tribes of the primeval race of man—the pigmies. They range from the Ihuru¹ River to the Awamba forest at the

¹ A tributary of the Upper Aruwimi.

base of Ruwenzori. We found two distinct types: one a very degraded specimen, with ferrety eyes, close set, and an excessive prognathism, more nearly approaching what one might call a cousin of the monkey than was supposed to be possible, yet thoroughly human; the other was a very handsome type, with frank, open, innocent features, very prepossessing. We had considerable experience with both. They were wonderfully quick with their weapons, and wounded to death several of our followers. The custom in the forest is to shoot at sight, and their craft, quick eyes, quick sight, correct aim, and general expertness, in addition to the fatal character of the poison of their arrows, made them no despicable antagonists. The larger natives of the woods, who form the clearings and plant immense groves of plantains, purchase their favour by submitting to their depredations. When they are successful in the chase or trapping, a fair trade is made between the pigmies and the brown-bodied planters.

SIR H. M. STANLEY.—*Scottish Geographical Magazine*, July 1890.

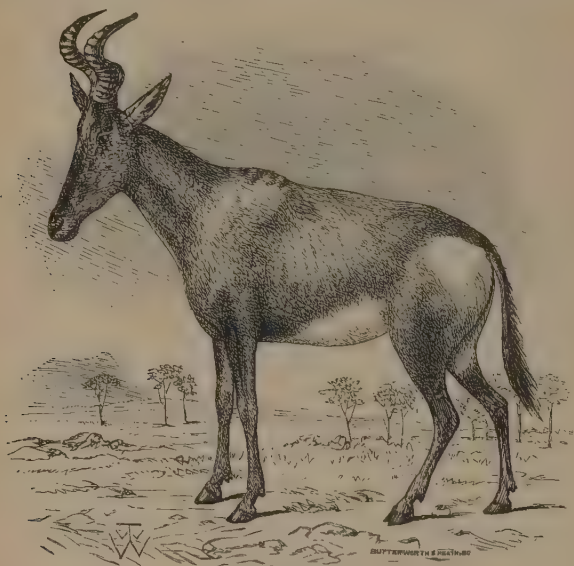
By permission of Sir H. M. Stanley and of the Royal Scottish Geographical Society.

Animals of the Congo

In the Lower Congo, in the direction of Lukolela and in the hilly districts,—that, is at the extremity of the equatorial forest,—buffaloes appear to me to be more plentiful than at the eastern boundary of the Manyema.¹ The antelopes which I have shot in the Congo, both in the forest and in the Manyema, are the pookoo, and the lechwe, which I had already seen and reported near Lake Bangweolo, a smaller variety of hartebeest, the large hartebeest, which I had not seen since being in South Africa, and a small brown antelope with straight horns, which abounds in certain parts of the forest. In the flat regions and at the extremity of the forest the zebra exists. The rhinoceros did not seem to me to inhabit the region; only

¹ Between the north of Lake Tanganyika and the Congo.

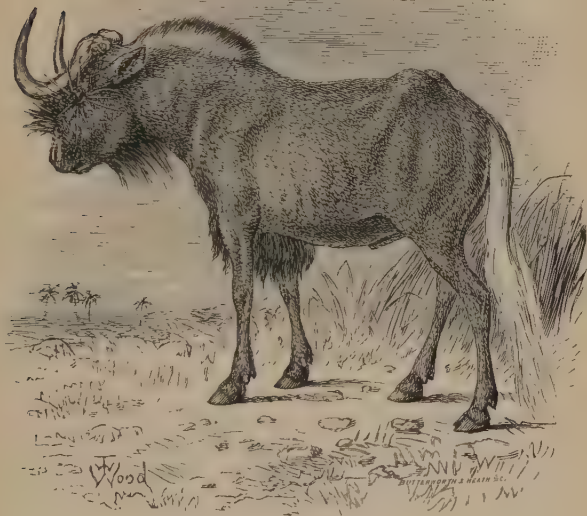
the natives near the lakes know it. It can only be found in my opinion on the eastern shore of Tanganyika. The lion is found only in Katanga, and in the vicinity of the Welle—that is, in the region of grassy plains. Leopards are very plentiful in certain parts of the Manyema. The equatorial forest contains relatively little game, which stops



THE HARTEBEEST.

altogether on boundaries near open countries. The elephant itself, which needs daily a considerable quantity of straw or grass, cannot inhabit the forest; it walks about in it, but only to get out of it soon afterwards. The Congo territory is well stocked with them. On the other hand, the forest is the home of an infinite variety of quadrumana. One may say, indeed, that the Congo is the native country of the monkey, all the species of Africa, from the small marmoset to the gigantic gorilla, are represented. In

certain regions every imaginable variety of hair and colour, all the various species of monkeys you see in the monkey-houses of zoological gardens, are met with on a day's march through the forest. Some flee as soon as they see you; others, bolder and more confident in the tree-tops, quietly look down as you pass; entire troops walking about on



THE WHITE-TAILED GNU.

the ground climb to the topmost branches of the trees on your approach, while others, which are already there, madly fling themselves into the air and slide down the lianas to the ground, so as the easier to escape. I noticed that if we proceeded with the main body of the expedition, the noise made by such a large number of men caused a perfect blank in front of us. We saw nothing; everything seemed dead. If, on the other hand, I was two or three

miles ahead, proceeding noiselessly and only accompanied by my gun-bearers, the forest had quite a different aspect ; everywhere there was life and animation. The forest and the banks of the Congo are inhabited, not only by monkeys, but by many species of birds and innumerable parrots. Hippopotami, lamantins, and aquatic birds are found there in large numbers.

E. FoA.—*After Big Game in Central Africa.* C. Black.

By permission of Messrs. A. and C. Black.

Peoples of the Congo

Speaking generally, the people of the Lower Congo are tall and well built, with supple limbs formed more for agility than strength, and oval heads and faces, quick with intelligent vivacity. Their women are larger and stronger than the men, and they all, in common with other races of the Congo, are remarkable for their small hands and feet, on which are bracelets and anklets of a size that no European could wear. Tattooing is very general, covering but a small part of their brown bodies ; and, as a rule, the hair is worn short. Families are distinguished by a singular method of filing the teeth to a point, or cutting them square, or in regular semicircles.

The Baoilis, a mixed tribe unfriendly to the whites, live upon oysters, and distil salt from sea-water. The Mayembés, a wilder race, are handsome and robust. The Musso-Rongo hold themselves aloof entirely from the rest, and are so independent that not even the most imminent peril will induce them to combine with their neighbours against a common enemy.

The food of these tribes on the coast is more varied than that of the natives in the interior of Africa. Their women do the cooking, grinding and sifting the manioc, a flour which forms the groundwork of their diet, and busy with household duties, while their children play about the huts, and babies sleep peacefully, rocked on their mother's hips.

Over a fire of wood that burns between three large stones these native cooks prepare an excellent broth, a hotchpot of odds and ends stewed with capsicum in palm-oil. These they eat out of wooden basins with wooden spoons and knives, drinking from earthenware or carved wood cups; and though tables are unknown to them, they have excellent taste in the manufacture of porous vases and pottery. In habits of personal cleanliness these African children of nature are a wholesome example to many in more civilised life. When they live near a river, or any water, they bathe several times a day, and in forests where this is impossible they smear their bodies with layers of oil and red powder, which they scrape off frequently. After each meal they rinse their mouths with water, and rub their teeth with the forefinger or with a rude tooth-brush of fibrous wood. The most popular costume—scanty, but sufficient for the climate—consists of gaudy stuffs imported from Europe, which they drape in bold folds round their hips and loins. Large patterns and a change of fashion are a delight to them, while for choice of colours, red, white, and black find special favour; yellow does not come amiss; blue is tolerated; but green is rejected utterly.

CAPTAIN GUY BURROWS.—*The Land of the Pigmies*. C. A. Pearson.

By permission of Messrs. C. Arthur Pearson, Ltd.

Minerals in Belgian Congo

It is probably no exaggeration to say that Congo land will ultimately prove to be one of the richest mineral areas in the world.

The most mineralised portions of Africa are to be found along the great divides and high watersheds of the Continent. So with the Congo basin we find the two most important mining centres thus situated. One the Katanga Mineral Belt—on the highlands of the Zambezi-Congo watershed to the south, and a second—the Kilo Goldfields—on the Nile-Congo divide to the north-east,

a third—the Kasai Diamond Diggings—is situated on the edge of the Lunda Plateau, to the south-west, on both the Belgian and Portuguese sides of the border. Another highly auriferous belt, the wealth of which it is at present impossible to gauge, as the country is covered with thick tropical forest, runs along the western mountain ranges of the great Rift Valley.

Beginning with the Katanga Copper Mines, which are the most important in the Congo basin, rivalling those of North America and Chile, there has been some petty controversy as to who was the original discoverer of these rich deposits. As a matter of fact, no one can be said to have discovered them unless it be Livingstone, who obtained definite details of their existence during his last journey between 1867 and 1873.

T. ALEXANDER BARNS, F.R.A.S. — *An African Eldorado*. Methuen and Co., 1926.

By permission of Messrs. Methuen and Co.

Angola

Angola may be described as including within its limits the finest, richest, and healthiest regions of West Africa, though these better portions generally lie at a mean distance of 100 miles from the sea, and consequently are as yet very insufficiently known. The littoral of Angola, though much healthier than the other coast-lands to the north, is not of a very prepossessing character at first sight, and entirely misleads one as to the great richness of the interior. This is owing to its increasingly sterile, or rather desert, character as you proceed from north to south.

The chief river, commercially and politically, of this colony is the Kwanza, which Monteiro justly calls the "Gem of Angola." This fine stream, which is navigable by river steamers for nearly 250 miles from its mouth, has been in the possession of the Portuguese, during parts of its lower course, ever since the end of the fifteenth century.

It is situated some 200 miles from the mouth of the Congo, and enters the sea in 9° S. latitude. In some ways it may be taken as a zoological boundary, many peculiar West African animals and plants not straying far from its banks. It is an important commercial channel, and Dondo, which is situated some 200 miles from the sea, is a great emporium of south-west African trade, and attracts to its markets the products of the far interior.

There is a good deal of forest land in the interior of Angola, and most well-known African trees are represented. The oil-palm extends only as far as 10° S. latitude. Coffee grows wild on nearly all the highland districts, and in the north of Angola is semi-cultivated by the natives of the interior, who bring it in enormous quantities to the coast, where it enjoys a good reputation among traders. The chief export of Ambriz is coffee. India-rubber, from the *Landolphia florida*, is a considerable feature in the Angolian trade. Cotton of good quality is very largely cultivated in the south, more especially in the district of Mossamedes. Some of the best plantations are on the river Koroka, in 16° S. latitude. Sugar is much attended to in all parts of Angola, in the low-lying portions, and in the vicinity of rivers.

SIR H. H. JOHNSTON.—*Scottish Geographical Magazine*, October 1885.

By permission of Sir H. H. Johnston and of the Royal Scottish Geographical Society.

VI. THE ZAMBEZI BASIN, AND THE NYASA-TANGANYIKA PLATEAU

The Zambezi as a Route to the Interior

By going some hundreds of miles southward along the coast from Zanzibar the traveller reaches the mouth of the Zambezi. Livingstone sailed up this river once, and about 100 miles from its mouth discovered another river twisting away northwards among the mountains. He followed this river up, and after many wanderings found himself on the shores of a mighty lake. The river is named the Shiré, and the lake—the existence of which was quite unknown before—is Lake Nyasa. Lake Nyasa is 350 miles long, so that with the Zambezi, the Shiré, and this great lake, we have the one thing required to open up East Central Africa—a water route to the interior.¹ But this is not all. Two hundred and fifty miles from the end of Lake Nyasa another lake of still nobler proportions takes up the thread of communication. Lake Tanganyika is 450 miles in length. Between the lakes stands a lofty plateau, cool, healthy, accessible, and without any physical barrier to interrupt the explorer's march. By this route the Victoria Nyanza and the Albert Nyanza may be approached with less fatigue, less risk, and not less speed than by the overland trail from Zanzibar.² At one point also along

¹ The Shiré navigation is interrupted by falls. See p. 175.

² This applies to the time before the railway from Mombasa was constructed.

this line one is within a short march of that other great route which must ever be regarded as the trunk line of the African continent. The watershed of the Congo lies on this Nyasa-Tanganyika plateau. This is the stupendous natural highway on which so much of the future of East Central Africa must yet depend.

PROFESSOR HENRY DRUMMOND.—*Tropical Africa*. Hodder and Stoughton.

By permission of Messrs. Hodder and Stoughton

The Zambezi

The Zambezi is the great river of Eastern Africa, and after the Congo, the Nile, and the Niger, the most important on the continent. Rising far in the interior among the marshes of Lake Dilolo, and gathering volume from the streams which flow from the high lands connecting the north of Lake Nyasa with inner Angola, it curves across the country like an attenuated letter S, and before its four great mouths empty the far-travelled waters into the Indian Ocean, drains an area of more than 500,000 square miles. As it cuts its way down the successive steps of the central plateaus its usually placid current is interrupted by rapids, narrows, cascades and cataracts, corresponding to the plateau edges, so that it is only navigable in stretches of 100 or 200 miles at a time. From the coast the Zambezi might be steamed to the rapids of Kebrabasa; and from that point intermittently as far as the impassable barrier of the Victoria Falls. Above this, for some distance, again follow rapids and waterfalls, but these are at length succeeded by an unbroken chain of tributaries which together form an inland waterway of 1000 miles in length.

The broad lands along the banks of this noble river are subject to annual inundations, like the region of the Nile, and hence their agricultural possibilities are unlimited. On the Lower Zambezi indigo, the crocodile weed, and

calumba-root abound, and oil-seeds and sugar-cane could be produced in quantity to supply the whole of Europe.

PROFESSOR HENRY DRUMMOND.—*Tropical Africa*. Hodder and Stoughton.

By permission of Messrs. Hodder and Stoughton.

The Mouths of the Zambezi

The Zambezi has eight mouths through which to pour forth its waters, all of which are probably brought into use in the rainy season, though only two are useful for navigation, the Chinde and the Kongoni, and only one of these is available for large steamers—the Chinde, the bar of which carries a depth of 19 feet at spring tides. The Kongoni carries 5 feet less, whilst the others are quite impracticable by reason of their dangerous bars. The Chinde has thus become the main entrance into Central Africa, whereby ocean steamers can avail themselves of a commodious port, and discharge their, and receive, cargo in safety.

COMMANDER H. J. KEANE.—*Scottish Geographical Magazine* March 1895.

By permission of the Royal Scottish Geographical Society.

The Zambezi Delta

The delta of this magnificent river may be said to cover an area of 2500 square miles. It commences some 90 miles from the coast, at a point a little below the confluence of the main stream with the Shiré River, for here during the rainy season its waters overflow into the marshy tract of country lying to the north of its left bank, and a small portion of this overflow finds its way to the Kwa-kwa or Quilimane River in a narrow, reed-choked channel, named the Barabanda. This channel cannot strictly be called a part of the Zambezi, as it is merely a drain that receives and carries away the surplus water of the morass of which it forms a part. At frequent intervals it widens

into more or less open swampy depressions, allowing a canoe or light-draught boat to be punted or paddled with difficulty during a few months in the year. At other times it can often be crossed dry-footed.

Passing this periodical outlet coastwards, the first real branch of the main stream is the Mosella River on the right bank, about 35 miles from the sea. This river has for its mouths the Kongoni and Melambe. Five miles further down, the Maria and Inhamacatiue rivers branch off from the left bank, and four miles below the latter is the Chinde River. These three rivers have two common outlets separated by the island of Mitaone, some 20 miles from the main stream.

The whole extent of this region south of the Mosella branch has nowhere an altitude exceeding 100 feet above sea-level. Towards the sea-board the altitude gradually decreases till, in many places extending for a distance of several miles from the shore-line, the country is below high-water mark, and is at high tides entirely submerged. The soil in these inundated districts is a soft, light-coloured mud, impregnated with salt and vegetable matter. It is densely covered with mangroves, that in some places grow to a great height, and give the lower waters of the river the appearance of being enclosed by an unbroken wall of tangled vegetation. At low tide, a wide border of loathsome slime and mud appears on either side of the discoloured streams. This district presents a network of small channels, many of them splitting up the land into islands and mud-banks; but the majority are mere *culs-de-sac*, losing themselves amid the dense vegetation in swampy depressions.

The delta, for the most part, is made up of low-lying, swampy land, intersected by ridges of uniform elevation at short distances apart. These ridges run in a direction corresponding with the coast-line, and are doubtless the remains of the old beaches. They afford the only dry spots in this land of water, and dwellings are only possible on their summits, since the low land between is during the

rainy season covered with water, and is overgrown with rank reeds and coarse grass. Along the top of these ridges, sugar, coffee, maize, and oil seeds can be grown in very large quantities, while the valleys offer, if systematically drained, which is not impossible, extensive fields for rice cultivation. The land immediately on the shore-line is low and swampy. The island of Inhamissengo, between the Melambe and the Kongoni bars, is nothing more than a huge mangrove swamp, with a few sand and mud ridges a mile from the sea. On one of these ridges, a few miserable mud huts that have been misnamed a town have been built; on another the lighthouse and flagstaff. It is a region whose soil is for the most part a fetid, rotting mass of loathsomeness, from which are exhaled foul stenches and steaming miasmatic vapours. Earth and sky reek with their load of malarial poisons. I have passed some of these beds of long rank reeds, from which the effluvia have been so foul and penetrating that for a day or more I have been unable to retain my food.

D. J. RANKIN.—*Scottish Geographical Magazine*, September 1889.

By permission of D. J. Rankin, Esq., and of the Royal Scottish Geographical Society.

For the Shiré, see p. 175.

From the Lupata Narrows of the Zambezi to the Kebrabasa Falls¹

At the Lupata narrows the stream diminishes very considerably in width, and the great flood of the Zambezi, which lower down has the enormous width of 2 or 3 miles, is here in places scarcely more than 1000 feet across. The banks are extremely picturesque, the hills at the side coming down sheer to the water's edge, and at

¹ "The first rapids are often called locally Acaba-basa (work is finished). This form is a Portuguese corruption of the older Semitic Kebra-basa (rapids of the Ba River); the term Acababasa is used by the native canoemen to designate the terminus of their voyage from the coast."—D. J. R.

some places terminating with a wall-like ledge of water-worn boulders. At the northern extremity, where the gorge ends, vast piles of mountainous walls rise sheer out of the river to a height of 2000 feet or more. Huge fissures filled with great trees and tendrils make a picture of considerable beauty, and the bright brown and red colouring of the rocks, sprinkled with the green vegetation and reflected in the clear water, greatly enhances the beauty of the scene.

It is here we enter upon the most valuable mineral deposits of this country. On the left bank, from the Lupata as far as the Acababassa (Kebrabasa Falls), there is an extensive and most valuable region of coal formation, extending over an area of 300 to 500 square miles.

Passing Tete, the country is flat in the immediate vicinity of the river, and on the left bank a few miles inland rise up, tier after tier, the highlands of the Makanga country. The land on the river bank is extremely prolific in orange, mango, and lime plantations, many of which stretch for miles in extent, giving a vast yield, though unfortunately they are turned to little commercial account.

At the Boromo mission, 20 miles above Tete, are stationed a number of Jesuits. Here the country again changes, and precipitous hills reach down to the water's edge on both sides. The channel, however, is deep, and possesses no obstacle to navigation. Proceeding further up, the river gradually narrows, and at the village of Massanangwe huge boulders of granite block up further navigation, and here the Acababassa Falls have their southern limit. From the north of the Acababassa there is no obstacle to navigation up to the town of Zumbo, whence there is uninterrupted navigation for 300 miles up the Loangwa River.

D. J. RANKIN.—*Scottish Geographical Magazine*, November 1892.

By permission of D. J. Rankin, Esq., and of the Royal Scottish Geographical Society.

The Kebrabasa Falls

The lofty range of Kebrabasa, consisting chiefly of conical hills covered with scraggy trees, crosses the Zambezi and confines it within a narrow, rough, and rocky dell of about a quarter of a mile in breadth; over this, which may be called the flood-bed of the river, large masses of rocks are huddled in indescribable confusion. In the dry season the stream runs at the bottom of a narrow and deep groove, whose sides are polished and fluted by the boiling action of the water in flood. The breadth of the groove is often not more than from 40 to 60 yards, and it has some short turnings, double channels, and little cataracts in it. As we steamed up, the masts of the *Ma Robert*, though some 30 feet high, did not reach the level of the flood-channel above, and the man in the chains sang out "No bottom at 10 fathoms." Huge pot-holes, as large as draw-wells, had been worn in the sides, and were so deep that in some instances, when protected from the sun by overhanging boulders, the water in them was quite cool. Some of these holes had been worn right through, and only the side next the rock remained, while the sides of the groove of the flood-channel were polished as smooth as if they had gone through the granite mills of Aberdeen. The pressure of the water must be enormous to produce this polish.

DR. DAVID LIVINGSTONE.—*Narrative of an Expedition to the Zambezi.* Murray.

By permission of Mr. John Murray.

For the Morumbwa Cataract, the most serious obstruction in the Kebrabasa Falls, see *ibid.* p. 61.

The Victoria Falls

The Victoria Falls are unlike any other falls in the world. The river does not fall over a mountain side into a valley below; it plunges into a marvellous slit in the surface, right across the river's course, another slit being

continued through the country at right angles to that into which the river falls, one slit opening into the other at about two-thirds of the river's width across. The depth of these slits is, as I judged, about 250 feet, but I believe others give different depths; its width varies from 100 to 400 feet. Thus the river simply seems to disappear into the bowels of the earth; whereas it first plunges into the narrow fissure across its course, and then rushes through the other one, which, I believe, is 30 or 40 miles in length, and very serpentine in its course. These slits or fissures are cracks in the basaltic rock—how formed could not be said with certainty, except that water was not the power that operated.

Livingstone gave the width of the river above the falls as about 1000 yards, but in this he was immensely out. Firing with a long Henry rifle, sighted to 1100 yards, which was carried by our boy, the bullet was seen to strike the water a long way short of the opposite bank, and I judged it to be over a mile in width. Baldwin, I believe, reckoned it at 2000 yards, which, as it falls over the edge, appears to be 2 or 3 feet deep, plunges into an abyss only 100 feet in width, and then the whole volume of it rushes into and through another of the same width. The turmoil may be imagined when a river a mile wide is suddenly contracted into 100 feet in width.

To get the best view of the Victoria Falls as a whole, or, at all events, of so much of them as can be seen at once, it is necessary to get on to the wall of rock opposite the falling waters.

The sight here was truly marvellous. Facing the falls, which seemed almost within touch, to the right and to the left was a vast perpendicular mass of water, broken by one or two islands of rock on the edge, one of which, far to the left, was partly tree-covered. Columns of spray rose up white and steam-like, and a circular rainbow danced about the left, half-way down the abyss. The falling water did not present a smooth, unbroken surface, but was corrugated in rounded columns and depressions, showing alternately

dark and light effects that were very curious. In some places, where the rocky edge came nearer to the surface, it was beaten into snowy froth and spume.

The thunder of a thousand guns pervaded the atmosphere, booming and thudding in irregular rhythm. The whole world seemed in a tremor. The water quivered and flickered as it fell. It throbbed and pulsated at the bottom, like the throbs of a mighty engine. The spray shimmered and whirled, rolling back and forth in great lambent masses, ascending and sinking, sometimes dense and heavy, and then fading away into diaphanous clouds, which, as they spread themselves out, were dissipated into invisibility. The gleaming rainbow to the left, although in reality stationary, seemed to oscillate in measured motions, as though softly dancing to the music of the pulsations below. The iron-bound rock on which we stood shivered as if its foundations were assailed by a furious convulsion. Even the sun, as one looked up to it through the floating vapours, seemed to have lost some of its immobility, and to flicker in unison with the writhing of the mist. Looking over the edge into the far depths of the abyss, the sight was appalling. The mighty mass of water, as it reached the bottom, was beaten up into a surging sea that would assuredly deal destruction to any craft that ventured upon its swashing surface. It was not a bit like the billows of the ocean nor the surf of the shore; nor did it resemble the boiling of a volcanic pool.

It was a long strip of water lashed into frenzied fury, distraught and chaotic. There was no purpose in its movements, no order in its fluctuations. Whirlpools and eddies, vortices and billows, breakers and water-spouts, were mixed up into inextricable confusion. As one looked down upon it the only thing one could make sure of was the immensity of its unrest. A surging billow, crested with snowy sud, was a billow but for the fraction of a second; but before the eye had fairly seized upon its being, it was transformed into a vast vortex, whirling in eddying circles, and lined with an unctuous facing of foamy lacework. Then almost



VICTORIA FALLS.

before the vortex was a vortex, it appeared as a hundred little pyramids of greeny water, each throwing from its pinnacle a cloud of frothy bubbles. And so change revolved, with a rapidity that defied the eye and a diversity that no words could convey. And with them all went a sense of power and force that almost made one's heart stand still with terror at its stupendousness.

G. LACY.—*Pictures of Travel, Sport, and Adventure*. Pearson.

By permission of G. Lacy, Esq., and Messrs. C. Arthur Pearson, Ltd.

For another description of the Victoria Falls, see HOLUB, *Seven Years in South Africa*, vol. ii. chap. viii.

Rapids of the Central Zambezi

About 12 miles from Sesheke the woods came right down to the river bank, a foretoken of the chain of hills that accompanied the stream from the Burotse valley. East of Sesheke, where the country began to rise, I had noticed a cessation of the palms and papyrus, and west of Sekhosi (Katonga), where the stream has a considerable fall, was the commencement of the southern Burotse rapids and the cataracts of the Central Zambezi. They are caused by ridges of rock running either straight or transversely across the river, connecting links as it were between the hills on either side. The peaks of these reefs made countless little islands; and the further we went the more interesting I found their variety, some being brown and bare, whilst others were overgrown with reeds, or occasionally with trees of no inconsiderable height. Within 14 miles I counted, besides a cataract, as many as 44 rapids. In some cases the river bed beneath them presented a continuous sloping surface of rock, while in others it fell abruptly in a series of steps; rapids again were formed by great boulders that projected above the water, and I noticed one instance where the rocks made almost a barrier across the river, whilst only here and there were the gaps through which the current forced its way. The

first rapids at which we arrived were called by the natives Katima Molilo. Our oars sufficed to carry us over the first stretch of them, but afterwards the boatmen were obliged to get out and pull every canoe after them. On the 5th we crossed the rapids known as Muchila Aumsinga, which, as I found to my cost, only too justly had the reputation of being the most dangerous of any of the Sesheke and Ngambwe cataracts. They are formed by a considerable slope in the river-bed, combined with the projection of numerous masses of rock above the water. But the chief danger in crossing them arises from another cause. Between a wooded island and the left-hand shore are two side-currents about 50 yards broad, formed by some little islands at their head, and as no part of the rapids is sufficiently shallow for boats to be lifted across them the strength of the rowers has to be put to the test by pulling against the full force of the stream. The last rapids that I crossed were the most dangerous in all the Marotse country ; one of them was known as Manyekanga, the other was Miniruola. They were formed by ridges of rocks extending right across the river, with an average height of not much over two feet and a half, but the openings were so few and narrow that the water dashed through with the fiercest violence.

DR. E. HOLUB.—*Seven Years in South Africa.* Low.

By permission of Messrs. Sampson Low and Co.

The Upper Zambezi

The river is about 800 yards wide and extremely beautiful, rocky rapids and tree-clad islands combining to lend life and grandeur to the landscape on the one hand, while on the other the peaceful stillness of a magnificent stretch of clear blue water was only disturbed by the occasional appearance of a large herd of hippos, as they rose to the surface to take breath. On 14th August I reached the Ngambwe cataract. Here canoes have to be off-loaded and dragged some 700 or

800 yards overland. The following day I passed the Busha rapids, where the river flows in successive rapids through innumerable small islands covered with trees, which in places meet overhead. Here and there the mid-day sun lent a dazzling brilliancy to the disturbed waters. The almost undescribable intensity of light and shade thus created reminded me more of my childhood's conception of fairyland than of any real landscapes I have ever seen, and I doubt whether my eyes will ever again rest on a picture so gloriously perfect.

On the evening of the 16th I camped at the confluence of the Njoko (Monkey) River. This river is typical of the majority of rivers I met with on the north bank of the Zambezi. A clear, deep stream winds through an open grass valley from 400 to 800 yards in width, which, though dry in the winter, becomes swampy in the rainy season. The soil is a mixture of rich alluvial and sand, growing excellent cattle pasture. The valley is skirted on either side by forest on white sandy undulations, unbroken for many hundred miles save by the intersection of other and similar river valleys. The day after leaving the Njoko I passed through the Bombui rapids. Having passed the Kati rapids, I camped on 1st September at the confluence of the Lumbi River. A series of cataracts characterises this river for 2 miles from its junction with the Zambezi, when it becomes similar to, but rather larger than, the Njoko. On the 3rd, my canoes were off-loaded at the lower extremity of the rapids below the Gonye Falls. Here the goods have to be carried, and the canoes dragged over rollers for a distance of $2\frac{1}{2}$ miles, in order to clear the falls.

Three or four days later I reached the southern extremity of what is frequently described as the Great Burotse valley. Livingstone first spoke of the Burotse as a valley, though plain or flats would convey a more correct idea of what is in reality a huge treeless alluvial plain, in places 40 miles wide. In the winter season the Burotse yields an excellent cattle pasture, and, being free

from the tsetse fly, supports many thousand head of cattle. In the rainy season the river overflows its banks, converting the plain into a huge marshy swamp. The inhabitants build their villages and make their gardens on the mounds, which alone remain high and dry during the period of inundation. These mounds, many of which cover acres of ground, are the work of the white ant. The banks of the river here characteristically resemble what I have already described in the Shesheke district, low banks, reed-bound, and clear-cut.

MAJOR A. ST. HILL GIBBONS.—*Geographical Journal*, February 1897.

By permission of Major Gibbons and of the Royal Geographical Society.

For later explorations of the Zambezi, see MAJOR GIBBONS, "Exploration in Marotse and Neighbouring Regions," *Geographical Journal*, February 1901.

For the source of the Zambezi see *ibid.* p. 127.

The Shiré and the Productions of the Shiré Highlands

The natural and chief route to British Central Africa is through the Chinde mouth of the Zambezi, up that river for about 150 miles, and thereafter for about 160 miles by its tributary the Shiré to Katunga's and Chikwawa, near the foot of the Murchison cataracts. There is a long portage of between 60 and 70 miles before navigable water is again reached on the Upper Shiré. The transport on the rivers in British Central Africa is accomplished by flat-bottomed, stern-wheel steamers and barges, and on Lakes Nyasa and Tanganyika by screw steam-vessels of slight draught. The land transport is almost entirely confined to native carriers, as the roads are often unsuitable for waggon carriage, frequently suffering not only from steep grades, but also from the heavy wash caused by tropical rains.

Blantyre, the commercial capital of British Central

Africa, is situated in the Shiré Highlands, at an elevation of about 3400 feet, nearly midway in the portage between the Lower and Upper Shiré rivers. The Shiré Highlands are well wooded, and the rainfall has usually proved ample for the various cultivations pursued. At an elevation suitable for most tropical and sub-tropical plants, and with a rich soil, its products, both indigenous and introduced, are very varied. Amongst others the following are found growing wild: chillies, cardamoms, coffee, and indigo. Rubber, from the *Landolphia* creeper, has of late years proved a valuable and large source of revenue. The natives cultivate large gardens of maize, millet, cassava, numerous varieties of beans and peas, sweet potatoes, yams, etc. Some years ago the Cape gooseberry was introduced, and this most excellent fruit now grows wild all over the bush, as does also the tomato. Those two plants in fact take the place, in any neglected spot, of the common nettle in this country. The castor-oil plant also grows in a wild and semi-wild state, and is found a great nuisance in the coffee estate, owing to its persistent vitality. The banana of the country is so very creditable and prolific that its cultivation is left almost entirely to the natives, though it is employed to form avenues on coffee estates.

P. ROBERTSON.—*Scottish Geographical Magazine*, April 1900.

By permission of P. Robertson, Esq., and of the Royal Scottish Geographical Society.

For economic possibilities see *ibid.* pp. 237-241.

On the Shiré Highlands

We left Chiloma (Chiromo) on July 12, and a short march over a rich alluvial plain, made park-like by fine clumps of trees with grassy glades between, and yet tropical with its display of palm and baobab, brought us to the village of Mona. Next day we attacked the mountain barrier, or rather plateau escarpment, and after a hard climb amid pouring rain reached the top, at an altitude of about 4000 feet. Here we found ourselves on the watershed dividing the tribu-

taries of the Ruo from those of the Shiré. These uplands proved to be rich and beautiful beyond our expectations, while the prospect was magnificent. Away to the south we could command an extensive view over the great plains of the Shiré and Zambezi, with their fine isolated mountains. Eastwards the great Mlanje towered majestically over the plateau. To right and left mountain torrents had carved the land into a hundred picturesque shapes of hill and glen. Dense clumps of bamboo and isolated flat-topped acacias, hoary with clinging lichen, crowned the various eminences or spread themselves over the slopes. Deep down in sheltering dales tree-ferns, wild date-palm, and dracæna combined their graceful forms with arborescent giants and festooning creepers to form the gallery forests that so often shade and beautify the streams of Africa. Over this delightful country and still keeping to the watershed, we travelled for four days. A few more miles, through well-tilled fields and by populous villages, and we had rounded the granite dome of Soche, and Blantyre was before us.

JOSEPH THOMSON.—*Geographical Journal*, February 1893.

By permission of the Royal Geographical Society.

The Nyasa-Tanganyika Plateau

The height of the surface of Lake Nyasa is 1700 feet above sea-level. The country rises very gently from the lake at about 1 in 150 to some low hills 5 miles westwards. Then a series of ridges, gradually rising, merge at about 40 miles from Karonga into what is called the Tanganyika plateau, which at the first camp (Kamanura) is 4500 above sea-level. The Stevenson road, the construction of which for the first 50 miles is due to the generosity of Mr. Stevenson, who presented £4000 to this work, was well laid out through those low hills at a limiting gradient of about 1:10, and is about 10 feet wide.

The crest of the plateau, which forms also the watershed of the Congo basin, is roughly a line joining the north end

of Lake Nyasa and the south end of Tanganyika. Towards the south it slopes gently down at an inclination of 20 to 50 feet to a mile, and is drained mainly by the tributaries of the Chozi and Chambezi, whose waters flow into the Congo. The northern slope, draining into Nyasa, Rukwa, or Tanganyika, is steeper and more broken.

The plateau is covered with a thin scrub jungle, with



WEST END OF LAKE NYASSA.

grass 4 or 5 feet high growing between trees 12 to 15 feet high. It is not sufficiently thick to prevent walking in any direction. At the eastern end almost every tree is covered with white ants, and this, together with the want of water, has probably stunted their growth. From Mpanga to within a mile or two of Mbala (or, as it is now called, Abercorn) the country becomes almost treeless, and the sense of relief on reaching these open downs after the endless bush before met with can be imagined. On nearing Lake Tanganyika, the trees are bigger and

healthier-looking, and are not attacked in the same manner by the white ants. The real tropical jungle is only met with in patches on the Misuko range, and occasionally close to springs, or where the water is not far below the surface. Just before the rains break, the leaves on all the trees turn to a bright brick red, brighter than our autumn tints, but at almost the first shower resume a fresh green colour. There are a few borassus palms on the plateau, and in the damp ravines on the northern slopes of Ngungulu the rafia palm is common, and grows to a great height.

MAJOR F. BOILEAU.—*Geographical Journal*, June 1899.

By permission of Major Boileau and of the Royal Geographical Society.

Life on the Nyasa-Tanganyika Plateau

The villages are well built, but not always well kept, and around them are the gardens where their food and root crops are generally grown. The fields of corn are in the bush, sometimes miles away. The people are industrious when occupied with their own affairs, and the work of the community is fairly divided. The building of the huts is the men's work, with the exception of the plastering of the sides, and the making of the floors, which the women do. The hard work of cultivation, such as cutting bush, and fencing or ditching, is done by the men; the hoeing, weeding, and reaping is entirely the women's work. The care of the corn, the making of flour, and the cooking of the food, besides all the house work, is the women's work also; but it is the men who make the clothes.

There are very few cattle amongst these people, but what there are the men look after, while the boys help to attend to the goats and sheep, and the girls learn cultivation, cooking, and good manners from their mothers. In fact, during the time of cultivation and harvest there is a good deal of work for men, women, and children, and

it is difficult at that time for a white man to get labour for any work he may want done for himself. But during the dry season, when village work is scarce, the men turn out to do the transport of the white man's goods across the plateau, make his roads and bricks, and build his houses, so earning enough cloth and beads both to keep them and their families in clothes for the year, and to trade with other tribes for hoes, salt, axes, and many things they need, which are not made in their own villages.

In most villages some men employ themselves in making reed or grass mats, baskets, etc., and some of the women in making pottery, and as places often far apart are noted for making some of these things better than others, there is a constant movement of trade between them. Amongst the Atawa, the people on the Mweru marsh are engaged in making salt; the Afipa, noted workers in iron, make hoes and axes; and all the villages on Rukwa weave cotton cloths; and in all these things there is an inter-tribal trade. The Babemba produce nothing, and, to pay for their imports, formerly were in the habit of raiding the neighbouring tribes and selling the captives as slaves to the Arabs. A cloth, 4 yards of calico, a load of salt, a hoe, and a slave, were all units of equal value, and are nearly so still, though the slaves are no longer currency except in Lobemba.

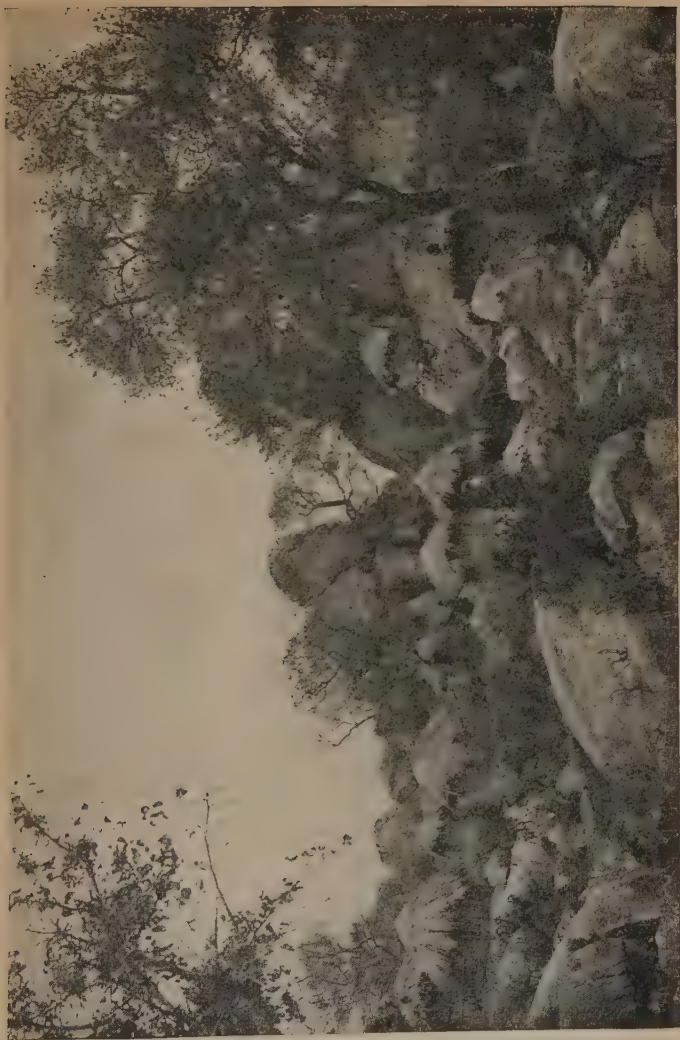
L. A. WALLACE.—*Geographical Journal*, June 1899.

By permission of the Royal Geographical Society.

Nyasaland Protectorate¹

The chief value of the British Central African Protectorate, compared to the adjacent countries, lies in the great proportion of high land over low and swampy country. Roughly speaking, about four-fifths of its land surface is 3000 feet and upward above the level of the sea, and about one-fifth is between 5000 and 10,000 feet. The immediate result of this elevation is a much cooler climate.

¹ Formerly called British Central Africa.



NATIVE KRAAL IN MASHUNALAND.

than is usually found in Central Africa so near the equator. Unfortunately it is impossible to reach this delectable land from the coast without traversing the hot and unhealthy valleys of the Zambezi and Shiré, and within the Protectorate itself one must at times descend to the shores of Lake Nyasa, or the marshy land round Lake Chilwa, and thereby receive the germs of malarial fever.

The great attraction of this country lies in its beautiful scenery, in its magnificent blue lakes, its grand mountains, its golden plains, and dark green forests. A pleasant and peculiar feature also of the western part of the Protectorate is the rolling grassy downs, covered with short turf, quite healthy and free from the tse-tse fly. These, no doubt, will in the future become actual sites of European colonies, in which Europeans can rear their children under healthful conditions. As an illustration of our mountain scenery let me take Mlanje, a mountain mass which in its highest pinnacles just reaches 10,000 feet. At the base of Mlanje there are many streams and a wealth of vegetation, among which may be seen the beautiful raffia palms and the wild date. Ascending through this dense tropical vegetation, one enters upon a rolling slope covered with high grass, about 6 feet high, with stems stout and strong, through which at times it seems almost impossible to force one's way. Then comes a belt of tree-ferns, more lovely perhaps than any other form of vegetation. There are breaks and open glades between the rows of tree-ferns and the witch-hazel forests,¹ which are a red gold with flowers of various compositæ, or, in the shadier parts, magenta with the innumerable balsam blossoms. Then one has done with the lower slopes, and is face to face with an abrupt rocky wall, which is quite a difficult bit of Alpine climbing, rendered more difficult perhaps by the desire to contemplate to the full the blue masses of lobelia and the red wax flowers of the aloes which grow out of the crevices of the rocks. One last frantic scramble, holding on by roots of grass, lands one on the top of a ledge, and

¹ *Trichocladus*.

then comes the great surprise. One has reached a new country, a Jack-in-the-beanstalk land. Far away stretch rolling grassy plains seamed with the course of streamlets, and diversified by handsome clumps of forest of the temperate regions. This is the upper plateau of Mlanje, a little world in itself, with the exhilarating climate of Northern Europe. The plains and valleys are gay with blue ground-orchids, with a purple iris, and with yellow everlasting flowers. Out of these elevated plains again rise other mountains, gloomy in aspect, and remarkably grand in outline. As one walks about on this tableland, and occasionally reaches the edge, an awful yawning gulf will reveal itself, and the eye, after getting accustomed to the abyss, can make out the whole country below spread out like a faint map. The whole mountain mass of Mlanje probably occupies, with its outlying peaks connected by saddles, an area of 1600 square miles.

Now, as a contrast, let us in imagination walk over one of the great plains, such as border the river Shiré along portions of its course, or lie along the salt lake, Chilwa, or on the western shores of Lake Nyasa. By the water's edge, or at intervals over the plain, are dotted groups of acacias and fan palms. The fan palm is either a species of *borassus* or of *hyphœne*. Its trunk is grey, smooth, and column-like; the fronds are often shaped with a slight whorl or twist, and are a cool, blue, glaucous green. The fruit of the *hyphœne* is a golden brown and about the size of a closed fist. The *borassus* nuts are a dark brownish green, and as large as a child's head. The outer covering of the *hyphœne* fruit has a faint sweet taste, something like gingerbread. It is much sought after by elephants, who to obtain it will drag down palm after palm. The rest of the plain is high grass—in summer it is like a waving grass-sea, with the white plumes of the reeds seeming to be flecks of foam. At this season these plains are almost impassable, except along the beaten tracks, but for seven months in the year the grass is either burnt down and reduced to blackened stumps by the bush fires, or dries

up into a golden straw which permits of freer movements. Among these great tufts of yellow grass the tawny lions lurk, and when one is crossing these plains in pursuit of game it is by no means an uncommon incident to put up a lion. Under the sparse shade of the acacias or the



LION LISTENING.

palms the black buffaloes will stand, chewing the cud and whisking off the flies with their tails. Zebras, hartebeests, water-buck, roan antelopes, may be found in numbers. The rhinoceros still ranges over these plains, and wallows in the stagnant pools of the half-dried rivers. The heat prevailing on the plains in the summer-time is very great; but in the winter and spring the air is exhilarating, and

in the latter season the thick rich scent of the acacia is a joy to the senses not to be forgotten.

In spite of their supposed unhealthiness I am always fascinated by marshes, and nowhere more so than in those parts of Africa where stagnant water is covered with blue water-lilies, and diversified by clumps of apple-green papyrus; where the reed islands are bordered and the narrow inlets are blocked by a huge duck-weed of the most vivid lettuce green, and very like a compact lettuce in shape. The intense verdure of this vegetation is thrown up by the occasional gaps of dark still water.

It is an abrupt change from such a scene as this to pass into one of our European settlements. Here will be seen clear broad level roads, bordered by handsome avenues of trees, and comely red brick-houses with rose-covered verandahs peeping out behind clumps of ornamental shrubs. The natives who pass along are clothed in white calico, with some gaudy touch of colour superadded. A bell is ringing to call the children to the mission school. A planter gallops past on horseback, or a missionary trots in on a fat white donkey from a visit to an outlying station. Long rows of native carriers pass in Indian file, carrying loads of European goods, or a smart-looking policeman, in black fez, black jacket and breeches, marches off on some errand. You will see a post-office, a court of justice, and possibly a prison; the occupants of which, however, will be out mending the road under the superintendence of some very smart policemen of their own colour. The most interesting feature in the neighbourhood of these settlements at the present time is the coffee-plantation, which, to a large extent, is the cause and support of our prosperity.¹

SIR H. H. JOHNSTON.—*Geographical Journal*, March 1895.

By permission of Sir H. H. Johnston and of the Royal Geographical Society.

¹ Condensed. The article is exceedingly graphic throughout and should be read in its entirety.

Diet of the Central African Negro

Farinaceous food is the mainstay of the Central African negro. The flour is mixed with water and boiled. When cool, it is rolled into balls and usually eaten with a relish — fish, fowl, meat, spinach made from various leaves, white ants, etc. Rice is boiled in a covered pot until the water is all absorbed. Indian corn, if not made into porridge, or boiled or roasted on the cob, is held over the fire on a tin plate until it is parched into "pop corn."

Millet and eleusine are reserved for making beer. The grain is soaked till it sprouts. Then it is pounded and thrown into a large pot of boiling water, to which is added flour to give body. After boiling and straining, the beer is poured into pots or huge jars of basket work, so tightly knit as to hold liquids. The beer must stand for a day, and is then fit for drinking. Sometimes bran, gruel of flour and water, half-pounded corn, and the malt made from the germinating grain are mixed, and form a sweet, thick beer, full of nutriment. Some chiefs at the south end of Tanganyika scarcely take any other food than this beer-gruel, and grow fat on it. The sap of most palms is tapped and drunk, as a sweet, heavy drink, which, when quite fresh from the tree (palm wine), is not intoxicating, but becomes very alcoholic after fermentation. Milk is the favourite food in North-West Nyasaland. Eggs are seldom eaten, and then usually when they have been sat upon for some time. Like the Krubos, the negro of Central Africa likes his egg "full of meat." Fish is split open and roasted. It is often dried in the sun, and eaten without further cooking. Sometimes it is made into a stew, with peppers and vegetables, and is then used as a relish, or, more rarely, it is fried in fat. The meat of poultry or beasts is roasted or stewed with vegetables and condiments. Cooking is done in clay pots. Women do

most of the cooking ; but any man or boy can, at a pinch, cook for himself.

SIR H. H. JOHNSTON.—*British Central Africa*. Methuen.

By permission of Sir H. H. Johnston and of Messrs. Methuen and Co.

Iron-working west of Lake Nyasa

The working of iron is certainly the most advanced art in this region of Africa. The ore is mined, smelted, and fashioned by the natives with great skill. Outside many of the villages stands the village smithy, merely a roof of shade boughs and grass, supported by stakes. Here congregate the village gossips, who justify their presence by an occasional turn at the bellows. The tools are primitive, a rock for an anvil, a weighty stone for the sledge, and pieces of iron bound to wooden handles for the finer shaping and ornamental work. The bellows consist of two goatskins, each furnished with an open mouth like a purse, and connected up by a piece of bamboo pipe to a narrow clay union nozzle about 9 inches long. The blower sits on the ground, seizes the mouth of each skin in either hand, and raises and lowers them alternately, first with the mouth open, and with a quick upward stroke to take in the air, then with the mouth closed, and a tremulous downward pressure to force the blast. By this rude process a hot charcoal fire is maintained, and the work turned out is excellent for the primitive implements used—knives of great utility, and which take a good, rough cutting edge ; arrow-heads and spears, many of them curiously barbed and twisted, and some showing a knowledge of the value of the “blood-groove” ; axes for battle and for general purposes, ornamented with linear patterns and beaded edges, and with the blades set at an acute angle to the shaft, so that every ounce of power is transmitted in the direction of the blow.

R. J. MONEY and Dr. S. KELLETT SMITH.—*Geographical Journal* August 1897.

By permission of the Royal Geographical Society.

A Hunter's Calendar in the Zambezi

From the hunter's point of view the seasons are divided in those regions—that is, south of the Equator—into three well-defined periods. December, January, February, and March : rain and tall grass. Animals are invisible—lost in the dense vegetation. Water is abundant ; everywhere are streams, rivers, rain-water pools, and marshes. Antelopes are very rarely seen ; big animals travel little ; elephants linger in the marshy regions. It is the time when the elephant, the rhinoceros, and the buffalo are hunted in preference to other denizens of the woods. April, May, June, and July : showery weather and tall grass, more or less dried up. It is impossible to walk in the bush without making a noise by brushing against the grass. Despite all precaution you announce your presence ; moreover, being ignorant of the position of animals you run the risk of being scented. Elephants begin to travel ; rhinoceros get under shelter at dawn ; antelopes are invisible. This is the most disagreeable and least fruitful period for sport. Rain-water pools and marshes have disappeared, and rivers begin to go down. August, September, October, and November : dryness. Fire clears the greater part of the country and burns the grass, leaving everywhere only trees, bushes, and shrubs, surrounded by a carpet of ashes which changes in November into a green carpet. Animals can be seen distinctly ; large animals seek wooded places impenetrable to the light, which the fire has spared. Antelopes collect in districts where there are drinking-places. Water becomes scarcer and scarcer, especially towards the end of November, and night watches can be made with success. During the day the absence of leaves and shade makes the heat overwhelming. This is the time for hunting antelopes.

E. FOÀ.—*After Big Game in Central Africa.* Black.

By permission of Messrs. A. and C. Black.

For an account of forest fires see *ibid.* p. 136.

Hunting in the Burotse Country

(a) The Lion

The hour may be about noon, and the heat is overpowering. Each of us walks along in silence, picking his way over the uneven ground. We tramp along without thinking, unless it be of that glaring sun beating down upon the desolate landscape. A sudden growl makes me start. An enormous lion, looking bigger than he really is because he is standing on an ant-hill, appears and shows his teeth. Seeing me stop to look at him the lion has disappeared in the grass, and the whole family, composed of five, the parents and three large cubs, are seen making off at a slow trot. We dash off in pursuit, but the unburnt grass becoming thicker we lose sight of them.

(b) The Elephant

The country in this part of the Burotse may be summed up in three words—plains, forests, and swamps. The plains are covered with stunted trees and short grass; the forests are very dense, but not great in extent; the swamps are large patches of soft mud covered with an apparently solid crust, sparsely grown over with grass, which has formed since the end of the rainy season, and gives way under your weight. One day we are in the middle of one of these marshy plains examining fresh elephant-tracks. Twenty yards in front of us is the edge of the forest, similar to a black impenetrable wall. A few shafts of light enable us to distinguish gigantic gnarled trunks and fantastic lianas. Invisible birds utter shrill cries. We are preparing to follow the tracks into the forests when suddenly the birds become silent, as though out of respect, and a great rustling of leaves mingled with the noise of broken branches, at first at a distance and then drawing nearer, make us stop short. Medium-sized trees sway backwards and forwards, liana and foliage half open; and there appears at the edge of the forest first the

back, then the head and body of an elephant. By its side is another, then one more, and soon there are eleven of them marching straight upon us. Almost in a row, as they always are when they eat, they proceed quietly, some occupied in eating lianas and leaves, others grass and fruit. They do not scent us, as the wind blows from right to left between them and us. One or two of them gather up sand and dust with their trunks, blowing it all over their bodies and leaving reddish clouds behind. Their large ears flap to and fro, and their trunks move incessantly. This was, I believe, the only occasion during my long sojourn in the woods, upon which we met with elephants purely by chance. These eleven colossal animals, suddenly emerging in line of battle from the immense forest, was one of the finest sights I have ever enjoyed.

(c) The Giraffe

During those two or three weeks we study the habits of the giraffe, and find that it inhabits, preferably, flat countries where, lacking *acacia giraffae*, which is its favourite food south of the Zambezi and is little met with in the Burotse country, it eats various leguminous plants of the same species. It takes the young shoots of the trees, and leaves *débris* strewn on the ground wherever it has eaten. When pursued it dashes into the thickest forest with an ease which seems incompatible with its shape; its head is lowered and passes under the branches; its long legs adroitly avoid the thousand obstacles in its path. In the act of running it makes with its neck a very regular, combined, upward and forward, downward and backward movement, at the same time ceaselessly switching its tail. Finally, it only goes at a walking-pace or gallop, without any intermediary speed. The more or less dark chestnut colour of wild giraffes makes them very difficult to distinguish in the distance, owing to their legs and neck being exactly the same shade as the tree trunks. When on the *qui vive* they keep perfectly still, completing the illusion; if

one thinks of looking at the tree tops instead of underneath, one can sometimes see their heads.

(d) **The Rhinoceros**

We move to the west of Undi, about five days' march from Mbazi Mountain. I meet there with the tracks of many rhinoceros, and pitch my camp for a few days to try my luck. This country is very uneven, consequently very fatiguing; there are ravines, river-beds, with perpendicular banks, hillocks, hills, and mountains to wind round or to climb, making you think that you are hunting chamois or bears rather than rhinoceros. The rhinoceros, however, are fond of these wild and tranquil places, and if they do not venture on to the mountainous parts, at least they frequent the hillocks whose stony soil, whether it be sparsely or thickly covered with vegetation, suits them equally well.

Setting off in the morning we soon find fresh footprints, which we follow for half an hour and then abandon to follow others which we see on the way, belonging to an animal a little larger than ours. As the rhinoceros cannot be far away, I consider it prudent to be on my guard. Five minutes have not elapsed before a well-known snorting is heard. The animal is a long time in appearing; it eats quietly and draws near little by little. Never have I seen the terrible animal so well. It scratches the earth with its right foot, and with two or three blows with its horn, which are given automatically and with the regularity of a pickaxe, unearths roots, which its prehensile lips tear up and its teeth crush; its ears move with its jaws, and its small tail swings to the right and left, with the object, on the face of it useless, of driving the flies away. On its back, neck, and flanks are insectivorous birds which call out, fly, run, and cling like magpies, in search of the many insects which are on the thick skin of the pachyderm. I raise my Express slowly and aim at the heart. The birds fly away at the report, and with a long neigh, almost a

whistle of pain, the rhinoceros mounts the slope of the hill right of the wind, without leaving me time to place my second bullet.

E. FOÀ.—*After Big Game in Central Africa.* Black
By permission of Messrs. A. and C. Black.

VII. SOUTH AFRICA

Scenery of Damara Land

THE ground we travelled on was still a crisp gravel, and extended far away to our right; on our left lay broken rocky ground, then the deep cutting of the river bed, which we often could see nothing of, though so near to it, and beyond, a complete chaos of broken crags and rugged hills; while level with the tops of these crags and far beyond them, we could clearly see long reaches of another barren plain, the counterpart of the one we were travelling over. We now emerged from the deep gorges and high cliffs that for so long a time had shut us in, and could breathe more freely in the open country that lay about us. We had left the arid Naanip plain behind, and were arrived to where thorny bushes and scanty grass overspread the sandy country. Fantastically peaked rocks arose on every side, and huge masses of mountains, that indicated the course of the Swakop, made a grand succession of distances; but there was a want, even painfully felt, of life in the landscape. The grass was withered, the bushes stunted and sear. No birds could be seen or heard, and every feature looked still and dead under that most saddening of lights, a blazing sun in an unclouded sky.

F. GALTON.—*South Africa*. Ward, Lock.

By permission of Messrs. Ward, Lock, and Co., Ltd.

Vegetation around Walfish Bay

After proceeding half a mile we came to the bed of the Kuiseb, a river that runs only once in four or five years, but, when it does, sweeps everything before it. The bed was very broad, and hardly definable; there were marks here and there like the bottom of dried-up pools, where the ground has been made into a paste and afterwards cracked by the drought. Bushes (dabby bushes I have always heard them called), not unlike fennel, but from eight to twelve feet high, grew plentifully; a prickly gourd, the 'Nara, with long runners, covered numerous sand-hillocks; and lastly, high shifting sand-dunes on either side completed the scene. We were so much out of condition that the depth of the sand and the heat of the sun (at least what we then thought was heat) gave us a good tiring, and we were heartily glad when Sand Fountain and its watering-place came in sight. My imagination had pictured, from its name, a bubbling streamlet; but in reality it was a hole, six inches across, of green stagnant water. It was perfectly execrable to taste, as many years had elapsed since the Kuiseb last ran, and the water which drains from its damp sand to the hollow here had become almost putrid and highly saline. However, it was drinkable, and I was satisfied that, with plenty of digging, enough could be obtained to water my mules. I have mentioned above the 'Nara, a prickly gourd, which grows here; it is the staple food of these Hottentots, and a very curious plant. In the first place, it seems to grow nowhere but in the Kuiseb and in the immediate environs of Walfish Bay; and in the second place, every animal eats it—not only men, cattle, antelopes, and birds, but even dogs and hyenas. It is a very useful agent towards fixing the sands; for, as fresh sand blows over and covers the plant, it continually pushes on its runners up to the air until a huge hillock is formed, half of the plant, half of sand. I do not much like its taste; it is too rich and mawkish.

F. GALTON.—*South Africa*. Ward, Lock, and Co.
By permission of Messrs. Ward, Lock, and Co., Ltd.

The Desert of South-West Africa

It is hardly too wide a generalisation to say that the Kalahari desert begins 50 miles south of the Congo. By desert a region of restricted rainfall and paucity of vegetation must be understood. At Ambriz, in $7^{\circ} 40' S.$ this dry parched country is about 5 miles in width, and at Mossamedes 70. Farther south it extends for hundreds of miles nearly across the narrowing termination of the continent. When this cheerless desert is crossed vegetation quickly assumes a very rich character, though its luxuriance recedes farther and farther from the coast-line as you go south. Thus 100 miles inland, in the district of Mossamedes (about $15^{\circ} S.$ lat.), you reach the fine tropical forests, which at Cabeça de Cobra, a point 50 miles south of the Congo, come down to the very seashore.

SIR H. H. JOHNSTON.—*Scottish Geographical Magazine*, October 1885.

By permission of Sir H. H. Johnston and of the Royal Geographical Society.

The Kalahari Desert

The Kalahari is not a desert in the ordinary acceptation of the term, any more than are Bechuanaland or the high veldt of the Transvaal. Comparing the Kalahari with those areas, we find similar surface springs in many places, the old stream and river courses now equally dry, and the land possessing the same natural fertility, while exhibiting a much larger proportion of bush and timber. After close observation I am convinced that in many localities the scarcity of surface water may be greatly reduced by shallow wells and by conservation; and in other parts (but not in all) a deep-seated supply of water may be relied on. *A priori*, it seems impossible that an abundance of timber and bush could subsist, or have come into existence, without a supply of moisture far in excess of that due to occasional periods of even heavy rain. Then

there is the geological testimony; and the observations herein classified are reliable, although frequently taken at intervals widely separated owing to the uninterrupted stretches of sand which nearly cover this region. This sand presents the only real difficulty in the solution of the problem of water supply in the Kalahari. It masks nearly all the older surface features. It rests equally on siliceous, calcareous, and argillaceous formations (on the alteration of which depends the flow of underground water), and it forms a flat or gently undulating plain, though it must vary from a few inches to several hundred feet in thickness. It is doubtless a blown sand, as it presents no essential local differences except slight variation in colour, in this respect differing from sands locally formed, which in texture, coarseness, and colour, indicate the rocks from which disintegration has derived them. The name "desert" has already had to recede from British Bechuanaland and Griqualand; so I think it will shortly have to recede still farther. It is true that most of the country west of, say, the longitude of Mafeking has a sandy soil, getting generally heavier as one goes west, and practically no visible water; but the sand, so far from being sterile, is covered with grasses, many of them well suited for stock; and where it is red it produces, in years of good rain, or where irrigation can be carried on by means of reservoirs, magnificent crops of mealies and Kafir corn. I have seen acres—I might almost say miles—of fields where I could not reach to the tops of the plants. It must be admitted that the bulk of this more favoured ground is in the native reserves; yet there are very many good farms to be had still, on which laagtēs or other depressions readily lend themselves to the construction of reservoirs, or on which water can be obtained from pits of no great depth.

E. WILKINSON.—*Geographical Journal*, April 1893.

By permission of the Royal Geographical Society.

Succulent Plants of the Kalahari Desert

The water-root, which has doubtless saved many from dying of thirst, is met with throughout the most parched plains of the Karroo. It is a large oval bulb, varying from six to ten inches in diameter, and is of an extremely juicy consistence, with rather an insipid flavour. It is protected by a thin brown skin, which is easily removed with the back of a knife. It has small, insignificant narrow leaves, with little black dots in them, which are not easily detected by an inexperienced eye. The ground round it is generally so baked with the sun that it has to be dug out with a knife. The top of the bulb is discovered about eight or nine inches from the surface of the ground, and the earth all round it must then be carefully removed. Throughout the whole of the great Kalahari desert, and the vast tracts of country adjoining thereto, an immense variety of bulbs and roots of this juicy description succeed one another monthly, there being hardly a season of the year at which the poor Bakalahari, provided with a sharp-pointed stick hardened in the fire, cannot obtain a meal, being intimately acquainted with each and all the herbs and roots which a bountiful hand has provided for his sustenance. There are also several succulent plants, having thick juicy leaves, which in like manner answer the purpose of food and drink. Above all, a species of water-melon bitter is thickly scattered over the entire surface of the known parts of the great Kalahari desert. These often supply the place of food and water to the wild inhabitants of these remote regions. Most of these roots are much eaten by gemsboks, which are led by instinct to root them out. The elephants also, apprised by their acute sense of smell of their position, feed upon them, and whole tracts may be seen ploughed up by the tusks of these sagacious animals in quest of them.

R. GORDON CUMMING.—*Five Years of a Hunter's Life in the Far Interior of South Africa.*

Watering Oxen in the Kalahari Desert

It was dreadful travelling, the sand very heavy, with a black dust rising from the grass, which had been burnt for miles. I was most anxious to water the animals at once;



THE GEMSBOK.

but he told me it was impossible, though he did not explain the reason. At earliest dawn I roused the camp, and we proceeded to lead or drive the animals to Maralilen. The water there was in a small fissure in the quartzite rocks about 12 feet down, and I was delighted when Shetlani sent up two buckets full of water without any delay. Then, however, we had to haul up sand for an hour or so,

and by this time the gathering of several natives—mostly women, armed with reeds—brought home the appalling idea that this was after all only a sucking pit. The suckers scoop out a hole as far as they can reach with their arm, and into this thrust two reeds, one with grass bound round the lower end to serve as a strainer, the other to keep up communication with, and thus the pressure by, the outer air; and then, filling in the hole again, they commence sucking, ejecting the water from their mouths into tortoise-shells or other receptacles. There was room for but three in the hole at one time. The rate at which they can work is extraordinary; and how those poor creatures worked, relay after relay, indefatigable beyond all others being Shetlani and his two wives. But fancy watering a span of oxen and horses in that way! The oxen were wild for water and could hardly be kept from the pit. Each was given three small buckets full; but the last did not get his till 2 A.M. on the 6th, long before which those watered early on the previous day were moaning for water again.

E. WILKINSON.—*Geographical Journal*, April 1893.

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Bechuanaland

North Bechuanaland is in many parts well-wooded and beautiful, its hills covered with vegetation to their summits. This is a country which is capable of sustaining a large population, when the appliances of civilisation have been introduced; but it is at present very sparsely inhabited.

South Bechuanaland is an open, grassy country, having much in common with the Transvaal, the Free State, and the eastern part of the Cape Colony, and is far superior in appearance and in actual natural value to the North-Western Province of the Colony from the Karroo northward.

The acacia trees, which are found at the foot of the hills and other sheltered parts of the country, would have been more abundant but for the cold in severe winters. I remember seeing a large tract of fine acacias in South

Bechuanaland killed by the frost of the severe winter of 1875. Then, the districts near Kimberley have been well-nigh denuded of trees in order to supply fuel for the engines at work in the diamond mines.

But this destructive work has been rendered less necessary and less remunerative since the opening of the railway to Kimberley in 1885, as coal now competes with firewood. The wild olive, the karee, and the wilgerhout are found in the plains and by the river banks of South Bechuanaland, while the mahatla and the moretlwa bushes give variety to the landscape, and afford grateful shelter to the stock in the cold weather. The Bechuanaland landscape during the dry winter months bears a solemn grey aspect, from the colour of the ripened prairie grass, but a few days after the first rainfall a glorious change takes place, as if by magic. Grey gives place to green, and Nature with lavish hand scatters everywhere brilliant flowers, to beautify a scene which in most cases is almost tenantless by man. During the summer months the rainfall is great. The old saying is strictly true there: "It never rains but it pours." I must add, however, that it frequently threatens to rain without doing it. You see the storm in the distance—you hear the growling of the thunder. On it comes, a blinding storm of dust, warranted not only to enter your nicely-dusted parlours, but your own eyes and mouth, and ears and nostrils. The thunder is now at its loudest, the lightning literally blinds and dazzles you; and sometimes all this is only "threatening," and there is no rain. After such a paroxysm, the copious tears of nature are welcome indeed. If it does not rain, every one is disappointed. We speak of "a fine rain" out there, while in this country you say, with an heroic effort at resignation, "Another rainy day." What has to be done in Bechuanaland and in South Africa is to conserve the rain which falls, and which makes haste to escape to the ocean.

J. MACKENZIE.—*Scottish Geographical Magazine*, June 1887.

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Rhodesia and its Climate

It must be obvious that the hygienic conditions of a country like Rhodesia, which is larger than France and Germany put together, and which includes the low-lying valleys of the Zambezi and the Limpopo, as well as the high open downs of Matabililand and Mashunaland, must be very diverse, and it may be broadly stated that only those portions of the country are suitable to North Europeans, where the altitude above sea-level renders the climate temperate. For in tropical Africa malarial fever is the white man's most deadly enemy; and as this most insidious disease is everywhere prevalent in Rhodesia, where the altitude is less than 4000 feet above sea-level, it is only the elevated back-bone of the country, which forms the watershed between the Zambezi and the Limpopo in the west, and the Zambezi and the Sabi in the east, which can be looked upon as likely to be peopled by white men; whilst in Eastern Mashunaland, where the country is extremely well-watered, many people suffer much from fever—though of a much milder type than in the hot tropical lands in the basins of the great rivers—even up to an altitude of 5000 feet.

The superficial area of that portion of Rhodesia which lies at an elevation of 4000 feet and upwards extends to approximately 26,500 square statute miles, whilst 72,500 square statute miles may be added which lie between 3000 and 4000 feet. The whole of the watershed, which extends from some 20 miles to the westward of Bulawayo north-eastwards to Salisbury, and from thence south-eastward to the sources of the Ruenya, Odzi, and Pungwe rivers, attains an altitude which is never less than 4700 feet, and which rises to the east of Salisbury to from 5400 to 6000 feet, and the Inyanga country at the source of the Ruenya River to over 7000 feet.

Once beyond the range of fever, however, the climate of this part of Africa is probably one of the finest in the whole world. Even in the hottest weather the heat

is not excessive, for the thermometer seldoms registers a temperature of over 90° in the shade on the high plateaus of Eastern Mashunaland—and 90° in the shade is not very trying to an altitude of 5000 feet—whilst the nights are always cool and bracing the whole year round. During the winter months, namely, May, June, and July, the nights are cold and frosty, and the days bright and clear—pleasantly warm, but not too hot. During the months of November, December, January, February, and March heavy rains may be expected, with thunder-storms during October and April, and sometimes a little light rain during the winter months. The rainfall is, however, very unevenly distributed after the five months I have mentioned, as in some years continuous rains set in early in November, whilst in others little or none falls till late in December. As a rule the heaviest rains take place after Christmas. The average annual rainfall would be probably over 40 inches, though of late years it has been frequently below that figure. Droughts or inadequate rains have been prevalent all over South Africa since 1891. In the rainy season, which ended in April of that year, however, a rainfall of 53 inches was recorded in Salisbury, Mashunaland.

F. C. SELOUS.—*Scottish Geographical Magazine*, October 1897.

By permission of the Royal Scottish Geographical Society.

Some South African Pests

I will now consider Rhodesia from an agricultural and pastoral point of view, but before doing so must point out that at present South Africa is suffering from a combination of plagues. In the first place the terrible scourge of rinderpest, which was probably introduced into north-eastern Africa from India or south-eastern Europe some seven or eight years ago, after first sweeping the great herds of cattle belonging to the Masai from the face of the earth, has been creeping gradually southwards ever since. Wherever it has been, the great herds of buffaloes and all

the various beautiful forms of antelopes which graced the plains and forests of Central Africa have almost disappeared. This dreadful scourge reached the Zambezi in 1895, and early the following year it appeared amongst the cattle in Matabililand. In March 1896 there were over 100,000 head of horned cattle. By the end of the year there were probably not 500 left alive. After destroying the almost countless herds of the Bechuana tribes, it invaded the Transvaal and Orange Free State, and finally crossed the Orange River to the Cape Colony.

Another plague from which South Africa has been suffering of late years is locust swarms. For seven years (1897) have those winged hosts devastated the whole country from the Cape to beyond the Zambezi, making agriculture well-nigh impossible. Lastly, South Africa has suffered of late years from a deficient rainfall.

F. C. SELOUS.—*Scottish Geographical Magazine*, October 1897.

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For details of the havoc wrought by locusts, see *ibid.* p. 509, and M'NAB, *On Veldt and Farm*, pp. 216-226. E. Arnold.

Resources of Rhodesia

In many places, especially on the high plateaus north of Umtali and in Matabililand, the conditions for successful farming are assured. The climate is healthy, and although the sun is powerful, there is always a fresh breeze. The soil is fertile, vegetables of all sorts, including the ordinary English fruits, growing luxuriantly. I have seen splendid potatoes and crops of wheat and oats. Cattle thrive well and are always fat. Wherever the farms are near a market large profits are made. In Gazaland, a healthy district south of Umtali, some 300 or 400 families, principally Afrikander, have settled and devoted their attention to farming. They have grown their own wheat and tobacco, tanned their own leather, used honey for sugar, and the juice of the india-rubber tree for candles. As soon as the road connecting Umtali with Salisbury is completed

their farms will be very valuable. Briefly the conditions for success in agriculture are all present. In a few years Rhodesia should be able to grow all its own horses and cattle. The one thing necessary to make agriculture profitable is a market, and that depends upon population; and whether the country becomes densely populated or not, depends upon the extent and richness of the gold mines there. A large number of very rich reefs have been discovered, and their richness proved to a very considerable depth and length.

G. S. FORT.—*Scottish Geographical Magazine*, June 1896.

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See also "Rhodesia," *Scottish Geographical Magazine*, February 1900, and MR. SELOUS's article already quoted.

Beira

The little settlement of Beira—it can hardly be called a town—is the capital of the territory of Manika and Sofala. This territory extends from the Zambezi on the north to 22° S. lat. The west boundary, Mashunaland, runs more or less parallel to the coast. The general features of the country resemble those of the rest of the east coast of Africa—a low swampy littoral of about 50 miles, very unhealthy on the whole, but capable of limited occupation at certain points, and behind uneven high ground. The low ground is intersected by numerous sluggish rivers with high banks, which flow through extensive mangrove swamps. The rivers are much affected by the tides and full of fish, few of which are edible, and are the home of hippopotamus, crocodiles, and fishing birds. The high ground is covered with low, knobby hills, carrying bush, small trees, and dense high grass. The Pungwe River is about 2 miles broad at its mouth, while 50 miles up it has narrowed to 100 yards. In the rainy season the banks are covered with water, and the adjoining swamps become vast lakes measuring many square miles in extent. It is said that canoes have been navigated from the Zambezi to Beira in

the rainy season, by taking advantage of connecting cross canals.

A. C. Ross.—*Scottish Geographical Magazine*, April 1895.

By permission of the Royal Scottish Geographical Magazine.

The Transvaal and Province of the Orange Free State¹

The Quathlamba, or Drakensberg, stretches northward along the eastern border of Basutoland and the Orange River Colony into the Transvaal, with an average elevation of 8000 to 10,000 feet. In the Transvaal it is somewhat lower, reaching its culminating point in the Mauchberg (8730). Eastwards, towards the coast, it descends rapidly in terraces, but on the western side it has a less imposing appearance, forming the edge of the central plateau, which lies 3000 to 4000 feet above sea-level. Beyond the Olifants River it breaks up into isolated chains, such as the Murchison and Zoutpansberg, running east and west. Other ranges in the Transvaal lie in the same direction, as the Witwatersrand and the Magaliesberg in the south, and the Waterberg and the Blaauwberg in the north, which rarely exceed 4500 feet. The central and western parts of the Transvaal and Orange River Colony are bush country (Bosch veld), lying 4000 feet above sea-level, studded with small hills, but with no extensive elevations rising above the general level. The eastern part of the Transvaal, between the Drakensberg and the Lobombo range, is on the terraced escarpment of the plateau, and sinks in many places as low as 2000 feet. Westwards, the bush country passes into the dry steppes of Bechuanaland, and on the south the Orange River Colony is bounded by the Orange River, beyond which the country sinks, as on the eastern side, in terraces towards the coast.

The drainage of the plateau is carried off by two great river systems—those of the Limpopo and Orange rivers, the Witwatersrand in the south-west of the Transvaal forming the watershed between them. From the watershed the Limpopo sweeps round the northern border of the

¹ Formerly called Orange River Colony.

Transvaal, emerges from the Zoutpansberg at the Toto Azime Falls, and entering Portuguese territory reaches the sea after a course of nearly 1000 miles. It receives several affluents from the Transvaal and also from Matabililand, and has a catchment basin of some 130,000 square miles, but many of the tributaries being dry, except in the wet season, its discharge is comparatively small. More important is the Orange River. Its chief sources are situated in the Drakensberg, near the point where Natal, Basutoland, and the Orange River Colony meet. The Senku, rising at the foot of Mont aux Sources (11,000 feet), is the principal headwater. On the Orange River Colony frontier the Orange is joined by the Kornet Spruit, and some 100 miles farther by the Caledon, which along a great part of its course divides the Orange River Colony from Basutoland. In Griqualand West it is joined by its greatest tributary, the Vaal. This river, also rising in the Drakensberg, but much further north, runs along most of the boundary between the Transvaal and the Free State, receiving the Hart on its right bank and the Modder on its left.

ANON.—*Scottish Geographical Magazine*, November 1899.

By permission of the Royal Scottish Geographical Society.

For the gold-fields of the Zoutpansberg, see JEPPE, "The Zoutpansberg Gold-Fields," *Geographical Journal*, September 1893.

Climate and Resources of the Transvaal and Orange River Colony

Rain is most prevalent from October to April, when the winds from the south-east retain some of their moisture till they reach the plateau. In the east the annual rainfall is about 40 inches, at Johannesburg only 30, while it falls to only 12 on the western border. The rain is on the whole very uncertain, great drought prevailing at times, while at others the rivers are swollen and cause large and destructive floods. The climate, owing to the altitude of the country and the dry winds from the Kalahari desert,

is exceedingly healthy, with the exception of a few low-lying tracts on the Limpopo, Olifants, and other rivers of the eastern borderlands. The hot winds from the desert cause the average temperature to be rather high in spite of the elevation, the annual mean being 68° to 70° F.

Most of the Orange River Colony is well adapted for grazing purposes, and the rearing of stock and ostriches is the principal occupation of the people. Wheat-growing is, however, rapidly extending, particularly in the south-eastern part of the territory, where the soil is exceptionally fertile. The detritus washed down from the sandstones and limestones of the adjacent hills enriches the valleys. The crops are yearly increasing, and this country may, when transport is made less costly by the construction of railways, supply South Africa with cereals. Fruits also thrive, as well as trees, oak, pine, and fir.

The Hooge Veld, 4000 to 7000 feet high, occupies much of the south and east of the Transvaal, and is well suited for sheep. The Bosch veld on the north—grassy country interspersed with low hills and trees—is adapted for cattle and corn, while in the extreme north, coffee, sugar, and tropical produce would find a suitable climate. Tobacco of good quality is exported. The chief wealth of the Transvaal, however, consists in its mines. The Yzerberg, near Marabasstad, is a mass of rich iron ore. Coal is found in Utrecht and Walkerstroom, in Middelburg and Lydenburg, and copper, tin, lead, quicksilver, etc., are distributed all over the country. But the most important mineral is gold. The best known mines are the De Kaap and the Witwatersrand, though the mineral is also extracted in the Lydenburg and Zoutpansberg districts and elsewhere. The Witwatersrand consists of strata of sandstone, quartzite, slate, and conglomerate tilted at a considerable angle. The gold is found in the conglomerate veins, which are called “banket” reefs, from their resemblance to the sweetmeat called almond rock. The mines of the Orange River Colony are less important. Diamonds are found at Jagersfontein and Koffyfontein, and one or two other

spots. Coal, magnetic iron, odire, saltpetre, and salt are also worked.

ANON.—*Scottish Geographical Magazine*, November 1899.

By permission of the Royal Scottish Geographical Society.

The Witwatersrand Gold-field

Since the discovery of gold in the Transvaal, gold-mining has become by far the most important industry of the country. Before gold was found, industry was limited to agriculture and stock-raising, and commerce was represented only by the trade and barter which the up-country storekeepers carried on with the farmers.

Gold was known to exist in the Transvaal as long ago as 1845, but the first gold-field of real importance was that opened in the Lydenburg district in 1872-73. The Barberton fields were declared public diggings in 1884, and in 1886 the Witwatersrand district was proclaimed a public gold-field, owing to the great richness of the conglomerate beds near the centre of the Witwatersrand. Attention was soon concentrated on that area, and several of the mines were established, whose fame has since spread all over the world. The Robinson, the Feireira, the Crown Reef, and others, speedily showed that this was a field which bid fair to take a leading place among the world's gold-fields. Yet there were then few who imagined that the Rand would in 15 years eclipse all rivals, and even now they are few who realise its immense and astounding capabilities. The amount of coined gold in the world is estimated to have doubled itself in the 30 years between 1860 and 1890, and to have been at the end of that period about £736,000,000. The amount of gold within the range of practical mining in the Witwatersrand district of the Transvaal is probably four times that amount.

W. BLELOCH.—*New South Africa*. Heinemann.

By permission of Mr. W. Heinemann.

For a fuller account, see BLELOCH, pp. 9-38, and for other mines of Transvaal, pp. 39-132.

Johannesburg

Johannesburg extends for a considerable distance along a ridge of hills 6000 feet above the level of the sea. Around wherever the eye reposes it is arrested by mining-shafts, hauling-gear, engine-houses, and tall chimneys. Johannesburg presents a very English appearance—that of an English manufacturing town, minus its noise, smoke, and dirt. The streets are crowded with a busy, bustling, active, keen, intelligent-looking throng. Here are gathered together human beings from every quarter of the globe, the English possessing an immense preponderance. The buildings and general architecture of the town attain an excellent standard, style having been consulted and sought after, stone and bricks the materials, corrugated iron being confined to the roofs; solidity, permanence, and progress the general characteristics.

LORD RANDOLPH CHURCHILL.—*Men, Mines, and Animals in South Africa.* Low.

By permission of Messrs. Sampson Low and Co.

The Attraction of the Veld

To see the whole limitless plain bathed in a golden glory, changing to every shade of scarlet, and to feel the peculiar exhilaration of the early morning air, often made up for too little sleep, and I think that only on the veld is one fully conscious of the peculiar sensation of being absolutely alone with Nature. Nowhere have I ever realised to the same degree the vastness, the stillness, that is almost frightening, as in South Africa. And this peculiar feeling is most vivid in autumn, when Nature is more still than at other times. "Veld fever" is a malady, a longing indescribable, which comes over many South Africans who have lived much on the veld, and about the month of April many people feel it in full force. I suppose it is the

same sort of home-sickness that the Swiss feel for their mountains.

MRS. LIONEL PHILLIPS.—*Impressions of South Africa*. Longmans.

By permission of Mrs. Lionel Phillips and Messrs. Longmans, Green, and Co.

Basutoland

Basutoland has been frequently called the Switzerland of South Africa. Occupying, as it does, the very loftiest valleys in this part of the continent, and placed in the most favourable position for intercepting the south-easterly summer breeze, it is not surprising to find that, as in the case of Switzerland in Europe, Basutoland is the head and centre from which most of the large rivers flow. From the Tugela to the Orange, from the Vaal to the St. John's, all are replenished from its bountiful and perennial springs.

The climate itself is keen and invigorating during the winter, but too cold for the majority of the invalids. During the summer it is subject to heavy rains, but the intervals are bright and clear, and, the natural drainage being good, the conditions are very favourable for those strong enough to rough it under canvas.

The highest mountains are Mount aux Sources, Champagne Castle, and Giant's Castle, with an altitude from 10,000 to 12,000 feet. The scenery in many places is most magnificent. Over many of the precipices water falls all the year round, notably at the Maletsunyane Falls, where it takes an unbroken leap of over 600 feet.

A. S. and G. G. BROWN.—*Union-Castle Line's Guide to South Africa*. Low.

By permission of Messrs. Donald Currie and Co.

Mountains and Rivers of Natal

Starting from the coast, the Colony, by a series of almost regular steppes, attains an altitude of about $2\frac{1}{4}$ miles above

sea-level at the Drakensberg, where snow-clad peaks are no uncommon sight.

The most prominent points in the Drakensberg range are Champagne Castle or Cathkin Peak, 12,000 feet above sea-level. The next point is Giant's Castle, 11,000 feet; Mont aux Sources, also 11,000 feet. Tintwa comes next with 7500 feet of altitude, while Amajuba, of tragic memory, ranks last with an altitude of 7000 feet.

Of first-class streams there are three, the Tugela, the Umkomaas, and the Umzimkulu. The first-named, which is in the north of the Colony, is the longest and most beautiful. Taking its source in the Drakensberg it leaps with one bound over a cliff 1800 feet sheer into the Colony. The horse-shoe curve, from which the Tugela springs, is composed of serried mountains. Dark fissures seam the declivities, weird-looking trees cut against the soft-toned distance, the air is filled with the mystery, the loneliness, and the beauty of Africa. Leaving the pool at the base of the yet to be world-famed precipice, the river sets out on its 200 mile journey through forest and mountain, krantz and glade. The whole course is one huge panorama of beauty and wealth; for the most part, the latter is only in its initial stage of development. It is yet in the woof of destiny that this great valley, which traverses the Colony from end to end, will be the centre of more than one important industry, such as gold, copper, coal, and asbestos mining, while its fertile alluvial banks produce phenomenal crops of maize, Kafir corn, and many other descriptions of cereals.

J. FORSYTH INGRAM.—*The Colony of Natal.*

By permission of the Agent-General for Natal.

View of Natal from Van Reenan's Pass

Let us pause while at the top of the Drakensberg, ten or twelve miles before reaching Harrismith, and look back. We are in Van Reenan's Pass, 7000 feet above the sea, and immediately beneath the fine cone of Rensberg's Kop,

one of the few conical mountains of South Africa, where they are nearly all flat-topped. In front of us is spread out the whole of fair Natal, "the Garden of South Africa," tumbling away in a marvellous jumble of startlingly green rolling hills, dark bush-clothed valleys, and vast park-like expanses, all streaked and scored with lines of gleaming water. To the right frown the forbidding cliffs and precipices of Giants and Champagne castles, 11,000 feet in altitude, and on the left, 150 miles away, but clear-cut as if within reach, another conical mountain, under which nestles the Transvaal village of Wakkerstroom. If it be a spring day, and the usual thunder-storm has passed over, the great masses of cumuli rolled away to the south, the sea-line, 190 miles away, may be distinctly seen, and there be they who say they have seen the lighthouse on the Durban Bluff. It is a fine picture, partaking alike of the grand and the beautiful, the soft and the severe, and so clear and crisp is the atmosphere that little white dots of farm-houses, brown Kafir huts, and moving trains of waggons along the red roads, may be made out at distances so great that one hesitates to print them.

G. LACY.—*Pictures of Travel, Sport, and Adventure.* C. A. Pearson.

By permission of George Lacy, Esq., and Messrs. C. Arthur Pearson, Ltd.

South African Thunder-storms

The thunder-storms are often very dangerous and terrifying, and many people never get over their nervous terror of the thunder and lightning, though a grander sight it is impossible to see—the whole heavens a mass of living flame, the darkness only relieved by the blue forked flashes. Torrents of rain, accompanied by heavy gusts of wind, sweep the parched earth, and in the twinkling of an eye every little furrow becomes a miniature river. I have known a flash of lightning to kill a whole team of oxen, the current being doubtless conveyed by the "trek" chain; and the thunder succeeds it instantaneously, crack



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NATIVE KRAAL AND MEADLE FIELD BELOW MAJUBA.

ling at first like pieces of stone in a fire, or the report of numberless muskets, and finishing with a tremendous crash that seems to shake the very earth. It is not at all unusual during such storms for hail suddenly to fall, many of the stones equalling pigeons' eggs in size, which causes the greatest havoc among fruit trees and cultivated lands, and kills many sheep.

MRS. LIONEL PHILLIPS.—*Recollections of South Africa*. Longmans.

By permission of Mrs. Lionel Phillips and Messrs. Longmans.

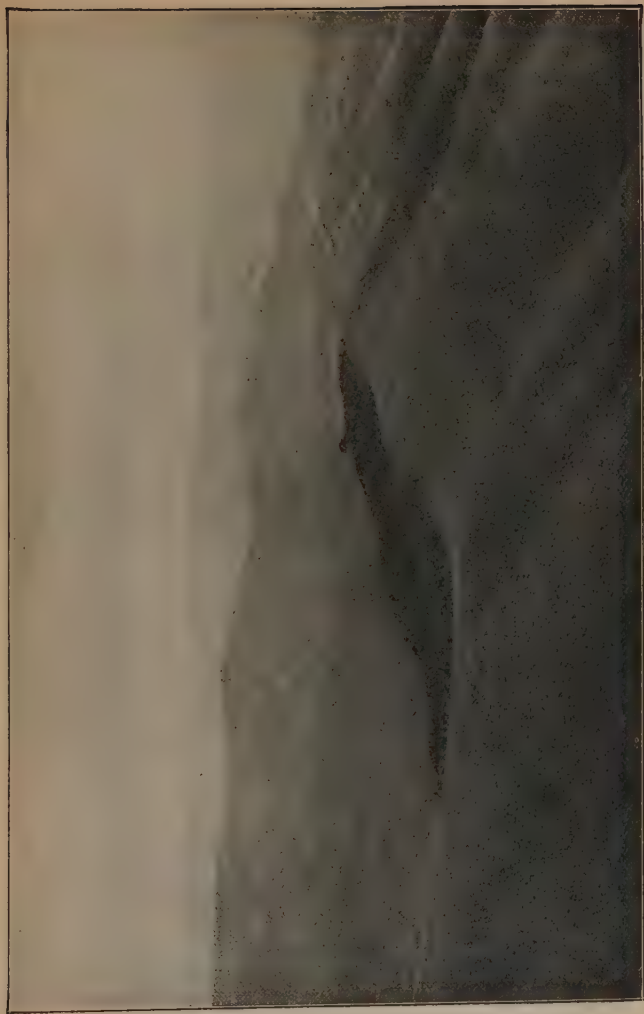
Province of the Cape of Good Hope¹

South Africa has been compared to the half of an inverted saucer, but resembles rather an irregular flight of four steps.

The Coast Plateau, forming the first step, is of irregular width, varying from a few miles to fifty, and averaging about 600 feet in height. The plateau adjoining the West Coast is bounded eastward by the irregular mountains of Namaqualand and by the Olifant and Drachenstein ranges. The South Coast Plateau, of far more importance, is divided from the highlands of the Southern Karroo by the Zondereinde, Lange Bergen, Outeniqua, and Lange Kloof mountains. Farther eastward the plateau loses its former well-defined character, and in some instances where the base of the mountains is almost washed by the sea, can scarcely be said to exist. The intermediate plateaus of the Southern and Central Karroos are also replaced by confined ranges of mountains and hills connected by long-swelling uplands peculiar to this part of the country.

The chief characteristics of the Coast Plateau are warmth and moisture. The distribution of the rainfall varies considerably in different seasons, the greater part of the coast-line of Cape Colony receiving its rains during the winter months from April to September. The three

¹ Formerly called Cape Colony.



G. W. Wilson and Co., Ltd.

THE LOW VELD.

hottest months—January, February, and March—are almost rainless at Cape Town. The coast-lands east of Port Elizabeth are, however, different. Durban, St. John's, etc., receive most rain in the summer—that is to say, during the same period when the rains are expected in Kimberley, the Transvaal, and the Orange River Colony, the winters being as a general rule dry and clear.

North of the coast plateau the ground rises more or less abruptly to the second plateau—which may be regarded as lying between the Zwaartebergen and the coast range. To the west the rise is gradual. Farther eastward the vegetation and climate partake more of the Karroo character.

In comparing the Southern Karroo climate with that of the coast-lands, a very great alteration is noticeable. The rainfall, except in the mountain slopes, is much less, and the range of temperature is somewhat greater.

After leaving the rich Goundini valley the scenery rapidly changes to bare, uninteresting veld, traversed by deep gullies which in summer are generally dry. In all directions the landscape is bounded by equally barren-looking mountains, whose steep, rocky sides appear from a distance to be entirely destitute of vegetation. Nothing can exceed the contrast between this scenery and that on the opposite slopes of the coast ranges, whence the traveller from the south, after ascending through luxuriant vegetation, frequently clothed in mist, emerges suddenly into a region of precipices and rocks, where rain may not have fallen for weeks.

The soil in the valleys, however, in spite of their unpromising appearance, is extremely rich when it can be brought under irrigation.

Beyond the Zwaartebergen, whose peaks range from 5000 to 7000 feet in height, lies the great plain of the Central or Great Karroo, extending east and west for a distance of about 350 miles, at a level of from 2000 to 3000 feet above the sea. Its northern boundary consists of the Nieuwveld and great Sneeuwberg ranges, whose



TABLE MOUNTAIN FROM GROOTE SCHUUR.

highest peak, the Kompass Berg, reaches an elevation of 7800 feet.

A. S. and G. G. BROWN.—*Union-Castle Line's Guide*. Sampson Low.

By permission of Messrs. Donald Currie and Co.

Beauty of South African Flowers

Throughout the grassy mountains which the hunter must travel, his eye is often gladdened by romantic dells and sparkling rivulets, whose exhilarating freshness strongly and pleasingly contrasts with the barren, rocky mountain heights and shoulders immediately contiguous. The green banks and little hollows along the margin of these streamlets are adorned with innumerable species of brilliant plants and flowering shrubs in wild profusion. Among these, to my eye, the most dazzling in their beauty were perhaps those lovely heaths for which the Cape is so justly renowned. These exquisite plants, singly, or in groups, here adorn the wilderness, with a freedom and luxuriance which could the English gardener behold he might well feel disheartened. I remember being particularly struck with two pre-eminently brilliant varieties, the one bearing a rose-coloured, the other a blood-red bell; and though I regret to say that I am but a poor botanist, even in the heat of the chase I paused, spell-bound, to contemplate with admiration their fascinating beauty. Others with their downy stems and waxen flowers of every gaudy hue, green, lilac, and various shades of pink, red, and crimson, some of them with brown lips to the bell, flourished in the richer hollows of their native glen, or bloomed with equal loveliness along the arid cliffs and fissures of the overhanging rocks. Almost equalling the heaths in beauty, and surpassing them in the additional attraction of their scented leaves, a whole host of geraniums fill the balmy breeze with their delicious perfume. Small groups of the lofty, conscious-looking iris rear their graceful heads along the edges of the streams. Another tribe of plants, which

particularly delighted me from old associations, though not so striking as many of its neighbours for perfume and brilliancy, was composed of several varieties of the light and airy fern, or bracken, which, whether gracefully overshadowing the mossy stones, eternally moistened by the bubbling spray of the stream, which they kissed as it danced along, or veiling the grey lichen-clad masses of rock in the hollows higher up, strongly reminded me of those so conspicuously adorning the wild glens of the mountains of my native land. Besides these, a thousand other gay flowers deck the hills and plains wherever the eye can fall. Endless varieties of the ixea, the haemanthus, the amaryllis, the marigold, and a number of everlasting flowers, are scattered around with a lavish hand; also the splendid protea, whose sweets never fail to attract swarms of the insect tribes, on which several bright kinds of fly-catchers, their plumage glancing in the noon-day sun, are constantly preying. Farther down these water-courses, in the dense, shady ravines, the jungle is ornamented with long tangled festoons of different creepers, among which the wild jessamine ranks foremost, hanging in fragrant garlands among the shaggy lichens and bunches of bright orange-coloured misletoe, for which the forests of Africa, in the vicinity of her sea-coast, are remarkable. While touching on the floral beauties of the hills more immediately adjoining the sea-coast, I may remark that here are the great nurseries for heaths and geraniums. As the traveller advances up the country these gradually disappear, and, together with the animal kingdom, the vegetable world assumes entirely new features, the colonial forest-trees and bushes being succeeded by a vast and endless world of loveliness, unseen, unknown, untrodden, save by those varied multitudes of stupendous, curious, and beautiful quadrupeds, whose forefathers have roamed its mighty solitudes from primeval ages.

R. GORDON CUMMING.—*Five Years of a Hunter's Life in the Far Interior of South Africa.*

East London

East London is very active in all commerce, having a large variety of manufacturing industries, such as furniture, wagon-making, boat building, printing, engineering, bootmaking, confectionery, biscuits, jams, and soaps. It advertises many allurements in the way of sport, recreation, motoring, scenery. And for family residence it appears to have every attraction that can be mentioned as an inducement to settle there.

Excellent water supply. Equable climate, smooth, clean sands on the shore. Delightful river scenery, sea air and breezes. Surpassingly good educational advantages. Proximity to the Transkei, which, with its population of over 100,000 natives in the model native reserve—wherein no European may enter without special permission—ensures a steady supply of cheap labour.

ALYS LOWTH.—*South Africa Calling.* Cecil Palmer.

By permission of the author and Mr. C. Palmer.

Cape Province Veld

The veld is of many kinds. The first distinction is between grass-veld and bush-veld, the former being characteristic of the regions under the influence of the wet summer monsoon, the latter covering the parts under winter rains, but extending along all coast lands, over many mountain ranges, and usually occupying the kloofs and valleys. The Karroo Plain is peculiar, for while what rain it gets falls chiefly in summer, it is covered with bush, grasses only appearing for a short time after rain and on the mountains. The term bush includes a great variety of plants, the short shrubs of the Karroos, the knee-high “boschjes” of the Western Province, the dwarf trees of the mimosa type, and the majestic timber trees of the natural forest. Grasses, too, vary, though not to the same extent, and combinations known as mixed veld are not uncommon.

The veld is known as "groot-vee-velde" (large stock) or klein-vee-velde (small stock), according as it is suited for cattle and horses or for small stock. Every breed of domestic animals has veld specially adapted for it.

Sweet veld is rich land producing nutritious food whether natural or cultivated. Sour veld gives good grazing during certain months, but becomes harsh, dry, and fibrous towards the end of the summer, and is then of no value.

To promote an early growth of young and succulent grass the very general practice of burning sour veld during the dry season has arisen. The propriety of doing so is one of the great questions of the day. Many insist that veld-burning is the only way of removing the old growth, which by sheltering the young vegetation would prevent cattle and sheep from getting at it till it was dry and woody. On the other hand burning materially alters the character of the veld. The more valuable feed appears to be that more easily killed. No doubt the pasturage is improved the first year, but in the second the burnt veld becomes more sour than ever.

The alternative is heavier stocking coupled with resting of the veld at certain seasons to allow the more valuable kinds of herbage to increase. A great advance in this direction is the sub-division of farms into camps and paddocks, thus limiting the stock to certain parts at certain seasons.

A question closely connected with the veld is that of vermin—jackal, lynx, leopard, wild cats and lesser beasts of prey. On this account the almost universal custom of confining stock to the kraal at night has arisen. Every morning the flock must sally forth to the grazing land, returning again at dusk, thus spending much time in travelling to and fro. By the continuous grazing which necessarily takes place no part of the veld is ever rested. Flowers are eaten off and possible seed destroyed. Young plants are nibbled down or trampled out, and bushes are gnawed, especially by goats. In this manner the veld is

becoming worn out over wide stretches, and several years of drought have brought matters to a very acute stage. The best remedy is the construction of jackal-proof wire fences, fences round whole farms or groups of farms, within which stock can graze at will, undriven by the shepherd, and allowed full freedom day and night. Sub-division of the farms into camps with ordinary fencing gives the veld an opportunity of resting, and allows the sheep that change of pasture which is so necessary for them. The system is still in its infancy, but in this direction lies the redemption of the veld.

Science in South Africa.—Official Publication. Cape Town.

An Impression of the Karroo

A railway station for feeding farms which are not visible, and a village which is over the horizon; a store which serves the same customers; a windmill, on a pair of shanky legs, that winds water up from the baked, mud-plastered ground; a plain reaching and reaching all round you, and enclosed by a rim of low blue smoky hills that make an insignificant fretwork on the base of the great dome of sky—a plain dappled with greens, dark and light, and clothed upon with millions of tufty shrubs the shape of large bath sponges. That is Hanover Road—that is, the high Karroo—it is all one; all things are of one piece on the Karroo. You sit on a stone and look on the unfeatured country and wonder if anything has any importance, after all, except the rising and dropping of the sun and moon and the revolutions of the stars. Two lizards glide out of the ground and sun themselves on the hot rock, and you know that the whole place belongs properly to them; a quick mere-cat swings its weighty tail through the brush; in the distance a tall ostrich stalks and pecks at the ground, and stalks on again. But twice a day the Karroo lives—a place of splendour and joy. Once is in

the morning, when the sun is still touching the hills; the air is a keen draught of health, and the dust, as yet unstirred, lies a gentle carpet beneath the feet. And the other time is in the evening, when the hills purple into duskiness, the sun throws up searchlights of brilliance—the spokes in a glowing wheel—and invests plain and hill and sky with resolving colours; grey cloud withdraws to show the orange gauze of vapours behind; the tufty sponges on the plain throw out spiky shadows; galleons of cloud are brushed along before a high breeze with fleecy sails; a menagerie of animals, green and pink and fiery red, come snapping after them; the air is clear and cool as the cheek of health—it is evening on the healthiest highlands of the world.

ANON.—*Manchester Guardian*, 5th May 1900.

By permission of the Editor of the *Manchester Guardian*.

Ostrich Farming

There are not many animals prettier than a little ostrich chick during the first few weeks of life. Instead of feathers it has a little rough coat which seems all made up of narrow strips of material, of as many different shades of brown and grey as there are in a tailor's pattern-book, mixed with shreds of black; while the head and neck are apparently covered with the softest plush, striped and coloured just like a tiger's head on a small scale. They grow quickly, and with their growth they soon lose all their prettiness and roundness; their bodies become angular and ill-proportioned, a crop of coarse, wiry feathers sprouts from the parti-coloured stripes which formed their baby-clothes, and they enter on an ugly hobbledehoy stage in which they remain for two or three months. A young ostrich's rough, bristly, untidy-looking chicken-feathers are plucked for the first time when he is nine months old; they are stiff and narrow with very pointed tips, and their ugly appearance gives no promise of future beauty. Not until

their wearer is plucked for the third time have they attained their full width and softness.

During the first two years the sexes cannot be distinguished, the plumage of all being of a dingy drab mixed with black. The latter hue then begins to predominate more and more in the male bird with each successive moulting, until at length no drab feathers are left. At five years the bird has attained maturity; the plumage of the male is then of a beautiful glossy black, and that of the female of a soft grey, both having white wings and tails. In each wing there are twenty-four long white feathers, which, when the wing is spread out, hang gracefully round the bird like a lovely deep fringe. The ostrich's body is literally a bag of bones, and the enormously developed thighs, which are the only fleshy part of the bird, are quite bare, their coarse skin being of a peculiarly ugly blue-grey colour. The little flat head, much too small for the huge body, is also bald, with the exception of a few stiff bristles, and scanty tufts of down, such as also redeem the neck from absolute bareness.

On a large farm, when plucking is contemplated, it is anything but an easy matter to collect the birds. Men have to be sent out in all directions to drive the birds up by twos and threes, from the far-off spots to which they have wandered. Little troops are gradually brought together and collected first in a large enclosure, then in a small one, the plucking-kraal. Besides the gate through which the ostriches are driven into the kraal, there is an outlet at the opposite end, through the plucking-box. It is a very solid wooden box, in which, though there is just room for an ostrich to stand, he cannot possibly turn round. At each end there is a stout door, one opening inside, the other outside the kraal. Each bird in succession is dragged up to the first door and, after more or less of a scuffle, is pushed in and the door slammed behind him. Then the two operators, standing on each side of the box, have him completely in their power. With a few rapid snips of the shears his splendid wings are soon denuded of their long



CROSSING A SPRUIT.

OSTRICHES.

white plumes. The tails, and the glossy black feathers on the bodies of the birds, having small quills, are not cut, but pulled out.

MRS. MARTIN.—*Home Life on an Ostrich Farm.* George Philip.

By permission of Messrs. Philip and Son.

The Kimberley Diamond Mines

The De Beers and the Kimberley mines are probably the two biggest holes which greedy man has ever dug into the earth, the area of the former at the surface being 13 acres, with a depth of 450 feet, the area and depth of the latter being even greater. The mines are no longer worked from the surface, but from shafts sunk at some distance from the original holes, and penetrating to the blue ground by transverse drivings at depths varying from 500 to 1200 feet. The blue ground, when extracted, is carried in small iron trucks to the "floors." These are made by removing the bush and grass from a fairly level piece of ground; the land is then rolled and made as hard and smooth as possible. These "floors" are about 600 acres in extent. They are covered to the depth of about a foot with the blue ground, which for a time remains on them without much manipulation. The heat of the sun and moisture soon have a wonderful effect upon it. Large pieces which were as hard as ordinary sandstone when taken from the mine soon commence to crumble. At this stage of the work the winning of the diamonds assumes more the nature of farming than of mining; the ground is continually harrowed to assist pulverisation by exposing the larger pieces to the action of the sun and rain. The blue ground from Kimberley mine becomes quite well pulverised in three months, while that from De Beers requires double that time. The longer the ground remains exposed, the better it is for washing. The process of exposure being completed, the blue ground is carried to very elaborate and costly washing machines, in which, by means of the action of running water, the diamonds are separated

from the ordinary earth. In this process 100 loads of blue ground are concentrated into one load of diamondiferous stuff. Another machine, the "pulsator," separates this latter stuff, which appears to be a mass of blue and dark pebbles of all shapes, into four different sizes, which then pass on to the assorters. The assorting is done on tables, first while wet by white men, and then dry by natives. The assorters work with a kind of trowel, and their accuracy in detecting and separating the diamond from the eight different kinds of mineral formations which reach them is almost unerring.

The natives are engaged for a period of three months, during which time they are confined in a compound surrounded by a high wall. On returning from their day's work they have to strip off all their clothes, which they hang on pegs in a shed. Stark naked, they then proceed to the searching room, where their mouths, their hair, their toes, their armpits, and every portion of their bodies is subjected to an elaborate examination. After passing through the searching room, they pass, still in a state of nudity, to their apartments in the compound. Here they find blankets in which to wrap themselves for the night. During the evening, the clothes which they have left behind are carefully and minutely searched, and are restored to their owners in the morning. Within the compound where the native labourers are confined is a store where they can procure cheaply all the necessaries of life. Wood and water are supplied free of charge, and a large swimming bath is also provided, but I did not learn if the natives made much use of it. All sick natives are taken care of in a hospital connected with the compound, where medical attendance, nurses, and food are supplied gratuitously by the company.

LORD RANDOLPH CHURCHILL.—*Men, Mines, and Minerals in South Africa.* Low.

By permission of Messrs. Sampson Low and Co.

Port Elizabeth

Port Elizabeth is a fine, prosperous, rapidly growing town situated on the sea coast in the large depression known as Algoa Bay. Having a large hinterland at its back, it is the centre of a big export and import trade. On its eastern side there is springing up a very considerable manufacturing centre devoted to the production of motor-cars and footwear: to westward of it is the seaside summer resort of Humewood. Hence Port Elizabeth is a place of varied interests.

The name of "Port" Elizabeth is entirely incongruous, as the place cannot be described as a proper port, there being no harbour. . . .

The trade in ostrich feathers has for a long time been almost a monopoly of Port Elizabeth, but owing to the lack of demand for feathers, the value of those exported has sadly shrunk during recent years. In pre-war days feathers to a value of over two million pounds were exported annually, but things are very different nowadays.

Feather Market Hall, the great building where the sales of feathers are conducted, is a gloomy spot. However, Port Elizabeth's trade in wool, mohair, and hides is in a healthy condition, and to outward appearance the place is very prosperous. . . .

The business portion of the town is situated close to the sea under the slope of the steep hill, on the top of which has grown up a fine residential quarter.

NOEL WRIGHT. — *Glimpses of South Africa*, 1928. A. and C. Black, Ltd.

Cape Town

For a few hours only before reaching Cape Town does one discern on the eastern horizon the stern grey mountains that rise along the barren coast. A nobler site for a city and a naval stronghold than that of the capital of South Africa can hardly be imagined. It rivals Gibraltar and Constantinople, Bombay and San Francisco. Immediately



CAPE TOWN AND TABLE MOUNTAIN FROM TABLE BAY.

G. W. Wilson and Co., Ltd.

behind the town, which lies along the sea, the majestic mass of tableland rises to a height of 3600 feet, a steep and partly-wooded slope capped by a long line of sheer sandstone precipices more than 1000 feet high, and flanked to right and left by bold, isolated peaks. The beautiful sweep of the bay in front, the towering flags behind, and the romantic pinnacles which rise on either side, make a landscape that no one who has seen it can forget. The town itself is disappointing. It has preserved very little of its old Dutch character. The miniature canals which once traversed it are gone. The streets, except two, are rather narrow, and bordered by low houses; nor is there much to admire in the buildings, except the handsome Parliament House, the new post office, and the offices of the Standard Bank. The immediate suburbs, inhabited chiefly by Malays and other coloured people, are mean.

J. BRYCE.—*Impressions of South Africa*. Macmillan.

By permission of Messrs. Macmillan and Co., Ltd.

From Cape Town to Bulawayo

Our special train left Cape Town at 4 p.m. on October 31. We were due at Kimberley, 647 miles, at 10.15 p.m. on the next day, November 1; at Mafeking, 870 miles, at 3.12 p.m. on November 2; Palachwe, in Khama's country, 1132 miles, at 12.47 p.m. November 3; and at Bulawayo, 1360 miles, at 9.30 a.m. on November 4, which would be ninety hours, at 15 miles per hour. At 5.30 we arrived at the Paarl, 35 miles, a beautiful place suggestive of Italy, with its vineyards, gardens, and shrubbery, and lovingly enfolded by the Drakenstein Range. With its grove of fir and eucalyptus, bright sunshine, and pleasant-faced people, with picturesque mountains round about, it seemed a most desirable place. Darkness found the train labouring through the mountainous defile of the Hex River. We could see but a loom of the rugged heights on either side, but from all accounts this part of the line is one of the show places which strangers are asked to note

At daylight we were well on the Karroo, which at first sight was all but a desert. The engineers who designed the line must have been skilful men, and by the track, as the train curves in and out of narrowing valleys and broadening plains, we are led to suppose that the continent slopes gently from the interior down to Table Bay. The railway is a surface line, without a single tunnel or any serious cutting. The gradients in some places are stiff, but a single engine finds no difficulty in surmounting them.

We were fast asleep by the time we reached Kimberley. Night, and the short pause we made, prevented any correct impressions of the chief city of the diamond fields. At half-past six of November 2 we woke up at Taungs, 731 miles. All that is wanted to render Bechuanaland a desirable colony is water, so that every farm might draw irrigating supplies from reservoirs along these numerous water-courses. For nature has so disposed the land that any one with observant eyes may see with what little trouble water could be converted into rich green pastures and fields bearing weighty grain crops. The track of the railway runs over broad, almost level, valleys, hemmed in by masses of elevated land which have been broken up by ages of torrential rains, and whose soil has been swept by the floods over the valleys, naturally leaving the bases of the mountains higher than the central depression. These dry river-beds, now filled with sand, need only to have stone dams built across, every few hundred yards, to provide any number of reservoirs. They have been formed by rushing torrents, which have furrowed the lowlands down to the bed rock, and the depth and breadth of the river-courses show us what mighty supplies of water are wasted every year. As the torrents slackened their flow, they deposited their sediment, and finally filtered through underneath until no water was visible, but by digging down about two feet it is found in liberal quantities, cool and sweet. Before we came to Vryburg, the continuous valley had broadened out into a prairie, with not a hill in sight. The face of the land was as bare as though ploughed.

By 4 p.m. we had come to the 850th mile, showing that the rate during the last twenty-four hours had been $16\frac{1}{3}$ miles an hour. Since Taungs, 731 miles, we had been closely skirting the Transvaal frontier, while to the west of the line lay what was once the mission-field of Livingstone and Moffat. An hour later we arrived at Mafeking, on the Moloppe River, a tributary of the Orange River. The next morning (November 3) we were well into Khama's country, 1071 miles from Cape Town. A thin forest of acacia trees, about 20 feet in height, covered the face of the land. The soil was richly ochreous in colour. The grass was young and of a tender green, and the air cool and refreshing. On the morning of November 4 we saw, as we looked out of the carriage, that the country was a continuation of that of the previous day. It was still as level, apparently, as a billiard table. We were drawing near to Bulawayo—were, in fact, due there about 9 a.m. We had been led to expect a more tropical vegetation, but as yet, though we were only 60 miles off, we saw no signs of it, but rather a return to the thorn bush of the Karroo or Southern Bechuanaland.¹

SIR H. M. STANLEY.—*Through South Africa.* Low.

By permission of Sir H. M. Stanley and Messrs. Sampson Low and Co.

¹ Much condensed.

VIII. AFRICAN ISLANDS

Madeira

THERE are few prettier sights displayed to the landsman weary of salt water than the island of Madeira. In the foreground is a chaotic pile of purple rocks, or the frowning bluff of a dark-red cliff; and beyond lies the slope of the mountains, marked with bands of varied hues—vineyards, orange-groves, olives, and plantations of sugar-canes. Here and there are houses, whose gleaming white walls glisten amidst the surrounding foliage, and higher up the heather and pine throw a dark mantle over the peaks; until, some 5000 feet above the sea, the mountains join hands with the white canopy of clouds which crowns them. As the steamer ploughs along, a ravine, with precipitous and rugged sides that yawn far back into the bosom of the hills until they are veiled in misty distance is opened up; or a hamlet of toy houses, with white walls, green shutters, and scarlet roofs, nestling down into an emerald valley, comes into view; till at last the Bay of Funchal, with the smokeless town lying back in the amphitheatre of the mountains, lies before you, and you have eyes for nothing else.

One of the first things that attracts the notice of the visitor to Madeira is the profusion of fruits and flowers of all descriptions. From its situation and equable climate the fruits of both Europe and the tropics thrive in the island. Even the hedges are made of myrtle, rose, honeysuckle, and jasmine, all in perpetual bloom, and every

garden is filled with tropical and sub-tropical flowers, which are only seen at home in conservatories. The hills are covered with lupin, larkspur, and fleur-de-lis; and in the spring the upper slopes of the mountains are fragrant with the perfume of acres of sweet violets. Of forest trees the principal are the pine, chestnut, cedar, and African oak. The slopes of the mountains around Funchal are covered with vineyards up to the limit at which the vine will grow, which is about 1800 feet above the level of the sea; and wine produced on this side of the island is worth about three times as much as that made on the northern side.

COL. A. B. ELLIS.—*West African Islands.* Chapman and Hall.

By permission of Messrs. Chapman and Hall.

The Canary Islands

Lying off the African coast, in the vicinity of Cape Blanco, between 27° and 29° N. lat., and 13° and 18° W. long., is that group of islands known in former days as the Fortunate Isles, and in modern times as the Canary Islands. Irrespective of such mere rocks as Allegranza, Graciosa, Lobos, and Santa Clara, the islands are seven in number, namely, Teneriffe, Grand Canary, Fuerteventura, Lanzarote, Palma, Gomera, and Ferro. Of these the two first-named are the most important in point of size and population; they are all Spanish possessions.

The island of Grand Canary is about 34 miles long by 29 broad, and, like all the islands of the group, is of volcanic origin and very mountainous. In fact it may in a measure be considered to consist of one mountain, since, from all sides, the land rises towards the culminating central peak of El Cumbre, 6648 feet above the sea. In the interior of Grand Canary there are no towns or even large villages, but small hamlets, embowered in verdure, nestle down beside the green terrace gardens in the fertile valleys. The hills are rugged and steep, and the scenery

wild and picturesque, but the absence of foliage renders the sameness of the local colouring monotonous; for the lower slopes are destitute of trees and the upper totally barren, not even grass growing upon their rocky faces. Although, with the exception of those engaged in the wine trade, and in the cultivation of the cochineal insect, almost the whole of the peasantry of Grand Canary are small market gardeners, the island is, generally speaking, very rocky and barren. It is, however, well watered by numerous mountain streams, and, with a little labour, might be made most fertile; but the islanders are content with raising their crops in the narrow beds of the ravines and valley. The pine, palm, wild-olive, laurel, aloe, and prickly pear are indigenous; and the climate is so equable that both the fruits of the temperate and torrid zones arrive at great perfection, the oranges of Grand Canary being particularly good. The cultivated area is, however, so small that the peasantry wisely confine their enterprise to the raising of fruit and vegetables for sale in the market of the capital, and they entirely depend upon the other islands, especially upon Lanzarote, for bread-stuffs. Their wants are few; the wool of their own sheep, spun by the women of the family, supplies them with clothing; and their food consists principally of salt fish and *gofio*, of which the former is caught principally on the banks on the opposite coast of Africa by the Canary fishermen, while the latter is a kind of *kous-kous* or damper, made of parched flour mixed with a little water. As they can neither read nor write, they have no literary needs to satisfy, and a *fiesta* on a saint's day, with an occasional cock-fight, supplies them with all the amusement they require.

Teneriffe, as seen from the outside, is rather grand than picturesque. Rounding Anagra Point, the most northerly point of the island, with its white lighthouse standing on the summit of the dark cliff, a rugged and majestic view is opened up. Trees there are none, and but a scanty verdure clings to the stony faces of the mountains; but there are stupendous precipices and scraggy heights, piled

up one above another, and intersected by deep and dark ravines that appear inaccessible to man. The chaotic confusion of the volcanic rocks is astounding, and where the base of the mountain has been worn down into bald scarps the traces of mighty convulsions are patent. Here and there molten streams have been shot up from below, forcing the superincumbent rocks into all kinds of unusual positions, sometimes vertical and sometimes diagonal; while at the cloud-capped summits of the heights, the ragged outline assumes the appearance of Titanic fortifications, forming a chain of ruined turrets and walls. Gliding closely past this wild and gloomy coast, we come to anchor in the roadstead of Santa Cruz.

The country in the immediate neighbourhood of Santa Cruz being very sterile, nothing much is grown but the prickly pear, which is grown in terraces on the hill slopes for the cultivation of the cochineal insect. In the spring of each year each leaf or lobe of the prickly pear is swathed in linen; and a plantation so adorned looks, at a little distance, like an array of bandaged hands. The reason of this practice is that at that season the queen cochineal insect, so to speak, is placed on the plant; and the linen wrappers are to keep her from being washed off by rain or blown off by wind. This work is principally performed by women, who are themselves bandaged from head to foot, like mummies, to escape being lacerated by the poisonous thorns.

COL. A. B. ELLIS.—*West African Islands*. Chapman and Hall.

By permission of Messrs. Chapman and Hall.

See also BINDLOSS, *In the Niger Country*, pp. 15-17. W. Blackwood and Sons.

The Cape Verd Islands

The neighbourhood of Porto Praya, viewed from the sea, wears a desolate aspect. The volcanic fires of a past age, and the scorching heat of a tropical sun, have in most places rendered the soil unfit for vegetation. The country



TENERIFFE.

risers in successive steps of table-land, interspersed with some truncate hills, and the horizon is bounded by an irregular chain of more lofty mountains. The scene, as beheld through the hazy atmosphere of this climate, is one of great interest—if, indeed, a person, fresh from sea, and who has just walked for the first time in a grove of coco-nut trees, can be a judge of anything but his own happiness. The island would generally be considered as very uninteresting, but to any one accustomed only to an English landscape, the novel aspect of an utterly sterile land possesses a grandeur which more vegetation might spoil. A single green leaf can scarcely be discovered over the wide tracts of the lava plains; yet flocks of goats, together with a few cows, contrive to exist. It rains very seldom, but during a short portion of the year heavy torrents fall, and immediately afterwards a light vegetation springs out of every crevice. This soon withers, and upon such naturally formed hay the animals live. It had not now rained for an entire year. When the island was discovered, the immediate neighbourhood of Porto Praya was clothed with trees, the reckless destruction of which has caused here, as at St. Helena, and at some of the Canary Islands, almost entire sterility. The broad, flat-bottomed valleys, many of which serve during a few days only in the season as water-courses, are clothed with thickets of leafless bushes. Few living creatures inhabit these valleys. The commonest bird is a kingfisher, which tamely sits on the branches of the castor-oil plant, and thence darts on grasshoppers and lizards. It is brightly coloured, but not so beautiful as the European species; in its flight, manners, and place of habitation, which is generally in the driest valley, there is also a wide difference.

CHARLES DARWIN.—*Voyage of the Beagle*. Ward, Lock, and Co.

Ascension

It is about $3\frac{1}{2}$ miles from Georgetown to Green Mountain, the highest point in the island, 2840 feet high.

Green Mountain is, as its name betokens, adorned with a little verdure; but it is the only spot in Ascension on which any vegetation may be seen. Throughout the whole way from Georgetown, until about half the ascent of Green Mountain is accomplished, not a tree or plant, and not even a single blade of grass, relieves the eye from the monotony of the endless cindery and lava wastes. At about 1000 feet of elevation a few sickly-looking prickly pears and aloes may be perceived, a little higher a scanty growth of grass and bushes clothes the earth, and finally the gardens cover that shoulder of the mountain on which the houses are built. The indigenous plants of Ascension are said to be the dandelion, chickweed, forget-me-not, nasturtium, tomato, Cape gooseberry, and some ferns and mosses; but willows, mulberries, bananas, and guavas have been planted, and would do fairly well if they had more water. Green Mountain is surrounded by rugged peaks of less elevation, having between them deep ravines filled with pumice and volcanic scoriæ. Gazing downwards on the island one sees nothing but the traces of volcanic action—harsh, rugged, and forbidding, and unsoftened, even in the deepest ravines, by any screen of vegetation. On all sides the direction of the old lava-floods in their course to the sea can be distinctly traced, and the tumuli of some forty extinguished craters are plainly discernable.

To the north of Georgetown, and close at hand, are the two turtle-ponds, in which all the turtle, the sole edible production of Ascension, that are captured are kept. These so-called ponds are large tanks, built of stone, and the sea is admitted by means of sluices too narrow to admit of a captive escaping through them. About 300 or 400 turtles are taken every year, some of them weighing as much as 800 or 900 lbs.

COL. A. B. ELLIS.—*West African Islands*. Chapman and Hall.

By permission of Messrs. Chapman and Hall.

St. Helena

The climate of the island is exceedingly healthy, the death-rate having, in several years, been as low as 1 per cent; and if the coloured population of Africans and Lascars could only be induced to adopt more cleanly habits, there seems to be no reason why it should not fall still lower. The levels of land suitable for cultivation ranging from the



VIEW OF JAMESTOWN HARBOUR.

sea-level to 2700 feet in Diana Peak, almost anything will grow, provided that it be planted at an elevation where the temperature suits it. Tree-ferns and cabbage-wood grow luxuriantly on the main ridge of mountains, where there is plenty of mist, while fuchsias and brambles flourish near the water-courses; and lower down one finds Scotch fir, oak, and larch. Near the sea, however, no vegetation is found beyond a scanty growth of samphire, and this causes

the island to appear very barren from the outside. Gooseberry and currant-bushes grow to a large size and become evergreens, but will not bear fruit; and all fruit trees that depend upon bees for impregnation are also barren, as the bee will not live on the island.

COL. A. B. ELLIS.—*West African Islands*. Chapman and Hall.

By permission of Messrs. Chapman and Hall.

Madagascar

Broadly speaking, Madagascar consists of two great divisions: an elevated interior region raised some 3000 to 5000 feet above the sea-level, and a comparatively level country surrounding it and not much exceeding 400 or 500 feet of elevation, but most extensive on the west and south.

The elevated region is largely composed of primary and crystalline rocks. Lines of hills traverse it in all directions, but they do not rise to a very great height; the highest point in the island, the peaks of the Ankaratra group of hills, being a little under 9000 feet above the sea-level. A good deal of this portion of Madagascar is bare and somewhat dreary-looking country. The long rolling moor-like hills are only covered with a coarse grass, which becomes very brown and dry towards the end of the seven month's rainless season; but the hollows and river valleys are often filled with a luxuriant tropical vegetation and, wherever there is population, with the bright green of the rice-fields. The lower region of Madagascar consists of extensive plains only a few hundred feet above the sea-level, but there are at least three prominent chains of hills traversing it from north to south, one of which appears nearly continuous in a very straight line for above 600 miles.

An interesting feature of Madagascar is the existence of an almost continuous belt of virgin forest all round the island, and generally following the coast-line. This forest divides into two belts on the eastern side of the country, leaving a long narrow valley about 250 miles long between

the two lines. The uppermost of these clothes the slopes which form the edge of the upper plateau of the island. North of this valley the two lines unite, and here is the widest portion of the forest, it being about 40 miles across. The average breadth is from 15 to 20 miles. On the north-west side the two lines overlap each other nearly 100 miles, leaving an opening about 70 miles wide. The total length of this forest must be about 2300 miles.

REV. J. SIBREE.—*The Great African Island*. Kegan Paul.

By permission of Messrs. Kegan Paul and Co., Ltd.

For the vegetation of Madagascar see *ibid.* chap. iv.

See also Dr. C. Keller, *Madagascar, Mauritius, and the other East African Islands*. Sonnenschein.

From Tamatave to Antananarivo

The road from Tamatave to Antananarivo passes first for about 60 miles, or two days' journey, southward, along the coast, generally between the line of lagoons and the sea. This is one of the most pleasant, as well as the easiest portion of the route, for the path is perfectly level, along park-like expanses of greensward, dotted with clumps of trees and occasional patches of forest, with the lagoons on one side, often expanding into broad lakes of calm water, while on the other we have the expanse of the Indian Ocean, with the never-ceasing roar of the surf, driven by the south-east trades.

At Andovoranto canoes are hired for a half-day's voyage up the river Iharoka and one of its tributaries. This is a pleasant change from the motion of the palanquin, and as we glide over the smooth stream impelled by the paddles of the boatmen, we are enlivened and amused by the canoe songs of our men.

The palanquin has, however, soon to be resumed, and we begin to traverse hilly country. Here, for about a day's journey, we are in the region of the traveller's-tree, the bamboo, and the raphia-palm, which fill every hollow, and by their peculiar and graceful forms give a special

character to the scenery. We gradually get higher, until, as we approach the outskirts of the forest-belt, we are about 1300 feet above the sea-level.

The comparatively easy travelling of the journey so far is now succeeded by three days very hard work for our faithful bearers, as we cross the line of forest which extends like a green girdle round so large a portion of the coast regions of Madagascar. The path, a mere track formed by the bare feet of the passengers, goes up and down the hills at very steep gradients, and these ascents and descents are, after two or three days' rain, just slopes of adhesive slippery clay, up and down which our men toil heavily with their loads. In fine dry weather, however, this portion of the journey is very enjoyable, the vegetation is magnificent, and the many new forms of orchid, ferns, and palm are a continual source of delight. The climbing plants which bind the whole forest together with cordage and ropes of all sizes are also a striking feature, and these sometimes reveal their presence by covering many of the trees with a mantle of creamy yellow or pink flowers. The path, although apparently descending as often as it ascends, is really gradually rising to a higher level, and by the time we get clear of the first and broadest line of forest we have ascended the first great step upwards to the interior highland.

Half a day's journey over the Ankay plain, and then across the Manvoro River, brings us to the foot of the second and steeper step of our road. Then comes the narrow belt of upper forest—very beautiful, but with as difficult a path through it as on any part of the route; and then at length we emerge on the bare moory hills of the upper region, and are in the province of Imerina.

Imerina is a mountainous country, with but little level ground except on the western side of Antananarivo, where the dried-up bed of an extensive ancient lake forms the great rice plain known as Betsimitatatra. This is the granary of the capital, and doubtless accounts for its position, and for the comparatively dense population around

it to the north, west, and south. But there are innumerable valleys where the slopes are terraced with rice-plots, like great green staircases, where the grain is first sown broadcast, and from which the young plants are taken up and transplanted in the larger fields along the banks of the rivers, and in the beds of small dried-up lakes of ancient date.

The general aspect of this region is bare, as it is destitute of wood, except in the hollows, although there are patches of primeval forest still left in the northern parts of the province. There is a great extent of moor-like hills, so that but for the brilliant sunshine and the generally clear skies, Imerina would, like much of the other central portions of Madagascar, be somewhat dreary, especially as the grass gets brown and parched towards the middle of the dry season.

Antananarivo is still about 30 miles distant, a good day's journey from the upper line of the forest. We see signs of a denser population as we advance; well-cultivated rice-fields in every valley, plantations on the hill-sides, numerous villages, and scattered homesteads. We pass the long mountain of Angavokely, with its double summit, one peak having a remarkable resemblance to a mediæval castle; and then the rounded dome-like mass of Ambatovory, with its woods—a remnant of the primeval forest—nestling in the valley at its base; and then a long gradual ascent brings us to a high moor, from which a very extensive prospect is unfolded. Before us, at 9 or 10 miles distance, is a long and lofty ridge, stretching north and south, on which buildings can be plainly discerned, cutting the sky-line; in the centre are the lofty white roofs of the group of royal palaces; to the north are the towers of the prime minister's house, its glass dome shining in the sunlight.

It is certainly a very picturesquely situated town; the rocky ridge, on the summits and slopes of which the houses are built, rises at its highest point near the centre, to from 500 to 600 feet above the surrounding valleys and the

western plain, and its length, north and south, is not far short of 2 miles. At the southern extremity it slopes down abruptly to the valley, but at the northern end the descent is more gradual. At about two-thirds of its length from the south, a large branch or spur of the hill separates from the main ridge and curves round to the north-west with a tolerably easy gradient; so that the actual extent of the city is not realised from the eastern side, and one must ride round to the west to see how large a place it really is. The ridge, though long, is narrow, so that there is little level ground on the summit; and the majority of the houses are built on terraces, cut away on one side, and built up with retaining walls on the other. At the junction of the two northern branches of the hill there is a large triangular open space called Andohalo, where a market is held, and where great public assemblies are convened.

REV. J. SIBREE.—*Proceedings of the Royal Geographical Society*, November 1892.

By permission of the Royal Geographical Society.

Mauritius

At a distance of 120 miles to the north-east of Réunion lies the sister island of Mauritius, which since the beginning of this century has been a British colony. Less grand but with a loveliness of landscape which vies with that of the sister isle, Mauritius is likewise of volcanic origin. The surface of the island embraces an area of 708 miles.

The mountains rise somewhat precipitously from the coast, and pass into a central plateau which is dominated by the Piton du Milieu, 1945 feet. Its summit is formed by basaltic masses of horizontal structure. The highest elevation is in the south-west, where the mountains of Rivière Noire rise to 2710 feet. Pinnacles of unusual shapes rise on the west side, where there are the Pouce (2480 feet), near the capital, Port St. Louis, and Pieter Both (2674 feet), which has the form of an obelisk. This latter is

well-known to sailors, as it serves as a landmark for ships; it bears on its summit a spherical rounded block 100 feet high.

Besides the basaltic masses we must mention the recent marine foundations on the sea-coast, forming a fringing reef round the island. Darwin, who thoroughly examined the coral reefs of Mauritius, remarks that they stretch round the island and vary in breadth between half a mile and 2 or 3 miles. The reef is interrupted where the rivers flow into the sea, as live coral cannot survive a temporary exposure to fresh water.

The slight elevation does not permit such a cooling of the moist trade wind as takes place in Réunion, and thus the amount of rain is less uniform. At the time of the tropical winter rains the brooks are quickly flooded, while in the dry season they are short of water. The increasing destruction of the forests bears its part in this. As cultivated land was gained for the sugar-plantations, the space occupied by the forests, which was of great extent in the last century, has been gradually reduced to a few estates of no great size in the interior; this has lessened the fertility of the country. The climate is in consequence comparatively hot.

The single large town is Port Louis. It has 70,000 inhabitants, and owes its rise to its excellent harbour, which is well protected by coral reefs. The Creole element clings tenaciously to its original French character.

DR. C. KELLER.—*Madagascar, Mauritius, and the other East African Islands.* Sonnenschein.

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For Réunion see *ibid.* pp. 178-188.

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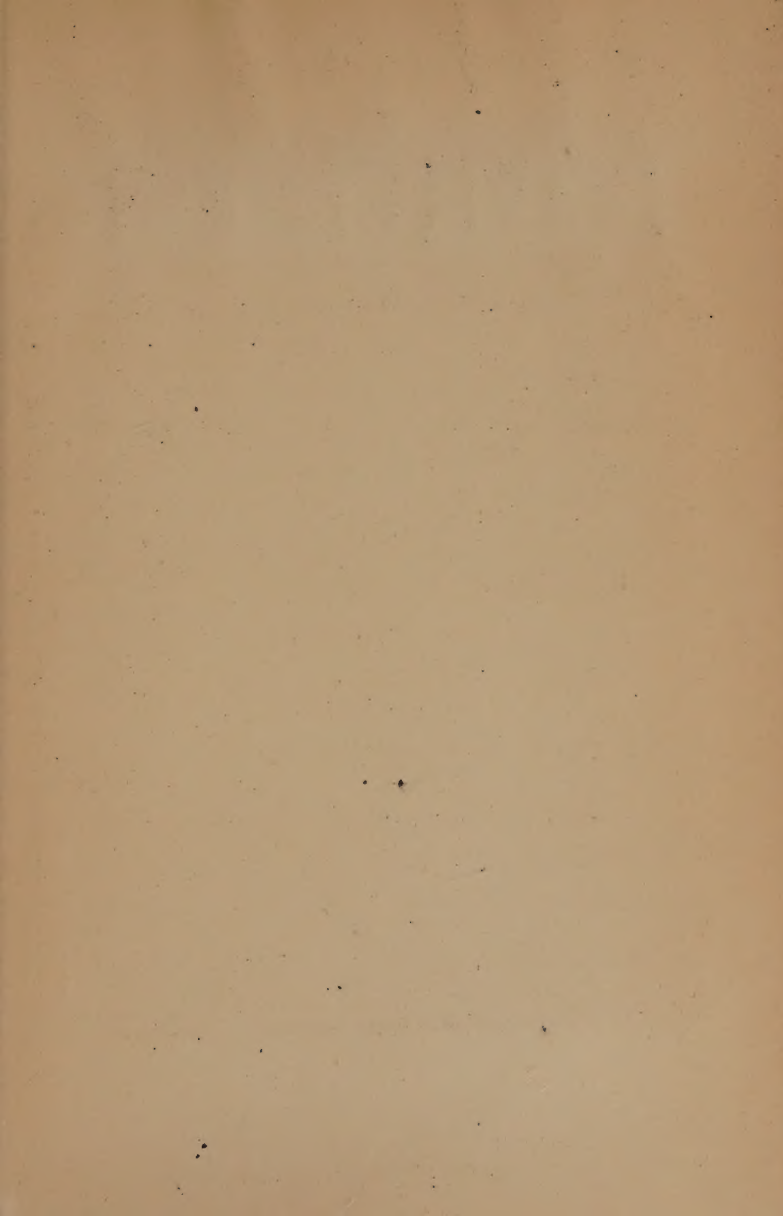
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